

LINDY®

COMPUTER CONNECTION TECHNOLOGY

P16-IP KVM Switch


User Manual

English



LINDY No. 32532

www.lindy.com

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Tested to comply
with FCC Standards

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About this manual

This manual is divided into four sections. The first section is an introduction to the P16-IP; the second section deals with installing and connecting the switch; the third section describes the basic operation of the KVM switch from the locally connected console; the fourth section describes operation via IP access.

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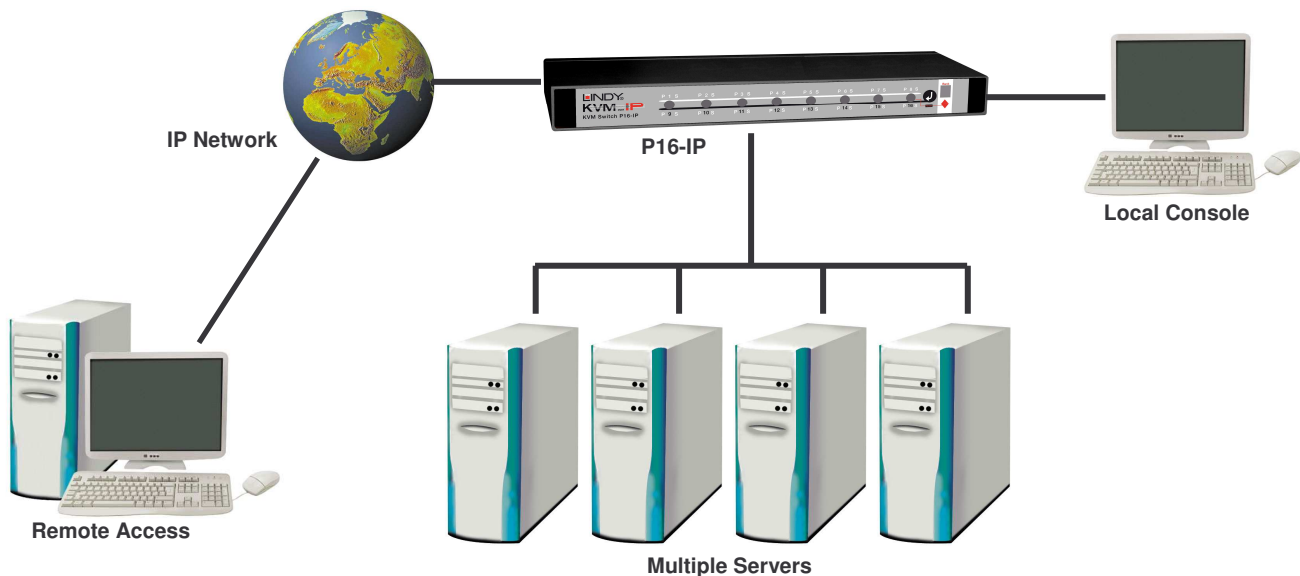
Section 1

Introducing the P16-IP

1.1 About the P16-IP

Thank you for purchasing the LINDY P16-IP!

This advanced 16 port KVM switch allows direct control of up to 16 computers from a single KVM (Keyboard, Video, and Mouse) console. Additionally, built-in KVM over IP technology allows a remote operator to access the switch, and the computers connected to it, from almost anywhere in the world using a simple web browser interface.



Remote & local control of multiple computers

The P16-IP provides a non-intrusive solution for remote access and control because the software runs on its embedded processors only, so there's no interference with computer operation, or impact on network performance. The P16-IP also features remote mass storage support; a USB connection from the switch to the one of the connected computers allows virtual storage to be set up on the host and accessed from the client.

The P16-IP supports computers equipped with PS/2 keyboard and mouse ports, and VGA monitor connections. USB equipped PCs, Macs and SUN computers are also supported when using the relevant USB to PS/2 adapter cable (LINDY No. 42866.)

The switch can be easily daisy chained with other LINDY P-series KVM switches (P4, P8 or P16, it cannot be used with PXT switches) to support up to 128 computer connections in total, all controlled from a single local console or via IP access.

Three methods of switching between the connected computers are available: by pressing the front panel push buttons; by using keyboard hotkeys; or via OSD (On Screen Display). Hotkey switching and OSD control is supported both locally and via the remote IP console. The keyboard and mouse connections of all connected PCs and servers are emulated at all times. This prevents error messages when switching between connected PCs.

1.2 Product Features

- 16 port KVM switch in a 1U, 19" rackmount size design
- Local console operation and KVM over IP control
- Support for LINDY mice and for all mice up to 5 buttons and 2 wheels with fully Microsoft compatible drivers. Some advanced features and proprietary functions of wireless/RF mice and keyboards with non-standard Microsoft® drivers may not be supported
- Remote mass storage device support
- Supports all commonly used operating systems
- Support for Mac and Sun computers with USB ports (an additional PS/2 to USB adapter i.e. LINDY No. 42866 is needed)
- Hot Plug Support - add or remove PCs for maintenance without powering down the switch or the PCs
- Very High Video Quality – Supports display resolutions of up to 1920x1440 for the local console
- No Software Required - easy PC selection via On Screen Display Menu, Push Buttons or Keyboard Hot Keys
- Eight character password protection and search function for server name
- Auto Scan Mode for monitoring computers and adjustable scan time from 5~99 seconds
- Keyboard status is restored when switching PCs
- LED Display for easy status monitoring
- Buzzer sound for port switching confirmation
- Uses special PS/2 + VGA cables with 15 Way Hi-Density connectors at the CPU Switch end
- Built-in daisy chain port allows additional LINDY P-series KVM switches to be connected to support up to 128 computers
- Permanent keyboard and mouse emulation

1.3 Package Contents

- LINDY CPU Switch P16-IP KVM switch
- Power Adapter
- 19" Rackmount Kit
- RS-232 Serial Cable
- USB Type A to B Cable
- KVM Daisy Chain Cable
- Utility & Manual CD
- Printed Quick Start Guides

1.4 Cables and Accessories (not included)

Apart from the computers to be connected, you will need a keyboard, monitor, and PS/2 mouse to use as a local console. You will also need dedicated LINDY KVM connection cables to connect the computers to the switch. Standard 3-in-1 KVM cables can be used to daisy chain the switch.

P16-IP KVM Cable (15 Way HD Male to 15 Way HD Male + 2 x PS/2 Male)



- P16-IP KVM Cable
 - 2m LINDY No. 32506
 - 3m LINDY No. 32507
 - 5m LINDY No. 32508
- Daisy Chain 3-in-1 KVM Cable
 - 1m LINDY No. 33711
 - 2m LINDY No. 33712
 - 3m LINDY No. 33713
- AT Keyboard to PS/2 Port Adapter Cable LINDY No. 70129
- USB to PS/2 Converter Cable LINDY No. 42866

Note: If some KVM cables are not long enough we recommend that the complete cable is replaced with a longer length rather than using extension cables. Extension cables introduce additional plug to socket connections, which can adversely affect the signal quality. Please bear this in mind when using high resolutions or long distances.

Section 2

Hardware Installation

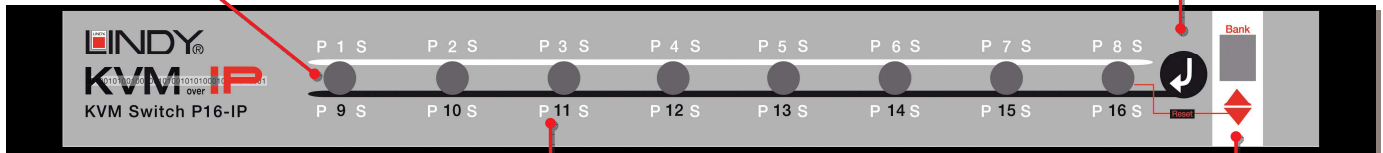
2.1 Product Information & Connection Guide

Port Push Button

Used for direct port selection. To access ports 1 to 8 simply press the button; for ports 9 to 16, press the 'J' button on the front panel and the required port button simultaneously.

Shift Button

This button allows ports 9 to 16 to be selected.



Port LED Display

When the LED labelled 'P' is illuminated **green** a computer attached to this port is powered on. When the LED labelled 'S' is illuminated **red**, the KVM console is connected to this port. If this LED flashes, the console is connected to this port, but either no computer is attached, or the attached computer is not switched on.

Bank Select Button

Pressing this button switches 'banks' and allows the computers connected to 'slave' switches in a cascaded installation to be selected. The LED above will display the selected bank. Pressing this button at the same time as the port 8 button resets the switch.

Make your connections to the switch as detailed below.

Ensure all devices are switched off before connecting. Once all connections have been made, power on the switch, your monitor, and the computers in that order.

10/100 RJ-45 Ethernet Port

Make your network connection here. This port supports 10/100Mbps connections and will auto-sense the correct speed.

Local Console Ports

Connect your keyboard, monitor and mouse here.

Computer Connection Ports

You can connect up to 16 computers to these ports using dedicated KVM cables. 'PC1' refers to the first port, 'PC2' to the second and so on...

Serial Port

A modem or RS-232 Serial Terminal can be connected here.



Daisy Chain Ports

These ports allow a slave P-Series KVM switch to be connected to the P16-IP using standard 3-in-1 PS/2 & VGA KVM cable.

Power Connection

Connect the supplied power adapter here. Although the computers connected to the switch may be able to supply enough power to the unit, erratic operation may occur if the power supply is not used.

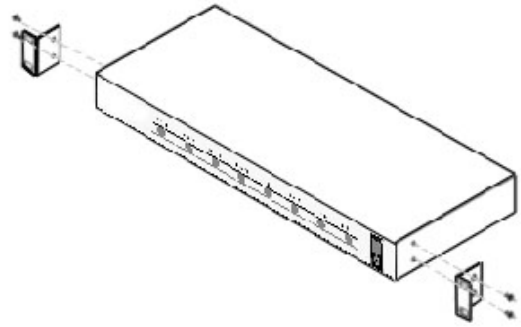
USB Port

Use the supplied cable to connect to a computer for remote mass storage support.

2.2 Rackmount Installation

Before you start please verify that all parts are included according to the package contents.

If you want to install the CPU Switch in a 19" server rack please attach the enclosed 19" rackmount brackets using the included screws.



2.3 Connecting an External Power Switch option

At the time of writing (November 2006) the P16-IP supports the following external power switch options. Please refer to the individual manufacturers manuals for advice on connecting to the P16-IP.

- Avocent SPC1 800/1600
- Sentry In-Line Power Module
- Leaning ePowerSwitch

2.4 Cascading / Daisy Chaining of multiple KVM Switches

The P16-IP can be cascaded with LINDY P-Series CPU switches only. It should not be used with LINDY PXT-Series CPU Switches. For all cascaded installations, the P16-IP should always be used as the **MASTER** switch.

To connect an additional switch to the **MASTER** (or previous) switch, you must use a standard (VGA + 2 x PS/2) 3-in-1 KVM cable, all connectors male.

Step 1 - Connect the local console

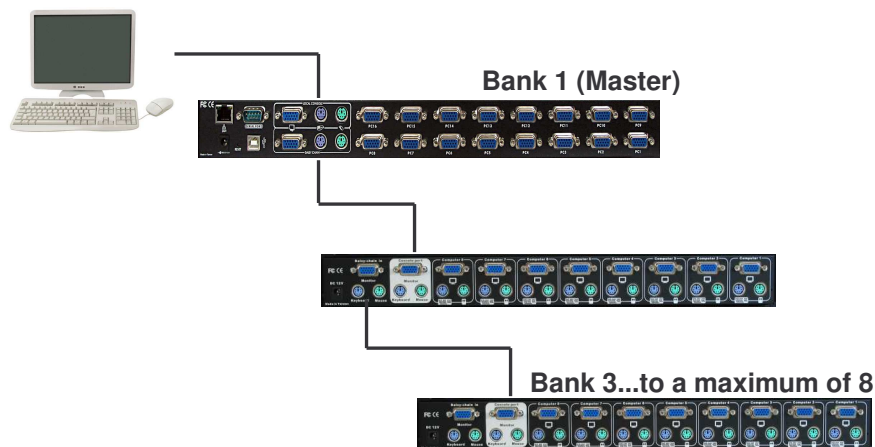
Connect your keyboard, mouse and monitor to the console ports of the P16-IP **MASTER** KVM Switch.

Step 2

Use one end of a 3-in-1 KVM cable to connect the **daisy chain port** of the **MASTER**/previous KVM Switch and the other end to the **console port** of the next **SLAVE** switch.

Step 3 - Cascading

Repeat the previous step to daisy chain more switches. Each individual switch in the chain represents a different **Bank**. The **MASTER** switch is Bank 1 and each cascaded **SLAVE** follows on as Bank 2, 3, 4 etc. **to a maximum of eight banks/switches.**



Note: If video quality deteriorates you can add a VGA amplifier between the fifth and the sixth KVM switch to enhance the VGA signal. (see www.lindy.com for appropriate products)

Cascading KVM Switches

Step 4 – Resetting the Switches

After you have connected and switched on the **SLAVE** switches and computers, all of the KVM switches must be reset. First, reset the **SLAVE** switch at the end of the daisy chain and then reset all of the other **SLAVE** switches up to the **MASTER** P16-IP switch.

To reset the switch, press and hold the Bank button and P8 button on the front panel of the switch.

Each **SLAVE** switch should now show a dash in its BANK display.

Now, reset the **MASTER** switch - it will show a 1 in the BANK display. Each **SLAVE** switch BANK display will now change to a number according to its position in the daisy chain.

Section 3

KVM Switch Operation

3.1 KVM Switch Operation

Important note: Your monitor will only display one PC signal at any one time. All keyboard and mouse commands are sent to this PC only. After initial power up, port 1 is active by default.

When a PC is connected to the currently selected port and it is not switched on, or is in sleep mode, the monitor will not display any signal.

Password Security

When you power on the P16-IP it will ask you for a password. The **default password is eight zeros –“00000000”**. Please key in eight zeros in the password field.

Note: Please don't change the password until you are familiar with the operation of the OSD menu – i.e. keep the default password “00000000”. Otherwise, if you forget the password, you will need to send the switch back to LINDY for maintenance to clear the password.

Hot Plug Support

The P16-IP supports a “Hot Plug” function for easy addition or removal of PCs. The user can arrange or maintain the PCs as follows:

- a. A PC can be disconnected and reconnected to the same or a different port of the KVM switch without having to power it off as long as it is currently not connected to the console.
- b. The mouse driver of the PC has to support the hot plug function or the computer may need to be rebooted when it is reconnected.
- c. You can unplug your mouse or keyboard from the console port and plug it back in at any time. You should not use different types of mice when doing this
- d. A SLAVE KVM switch can be added or removed at any time, but after adding or removing a switch you must reboot all of the switches. You DO NOT need to reboot the computers.

Please note: Some Operating Systems such as certain Unix versions are unable to support the “Hot Plug” function. If you Hot Plug when using this kind of O.S., it may cause unpredictable operation or may shut down the PC. Before attempting to use the Hot Plug feature, please make sure you're O.S. and mouse software driver support the Hot Plug feature.

Computer / Port Selection

You can select the computer you want to access in three different ways:

- Front panel push button selection
- Keyboard hotkey selection
- On screen display menu selection

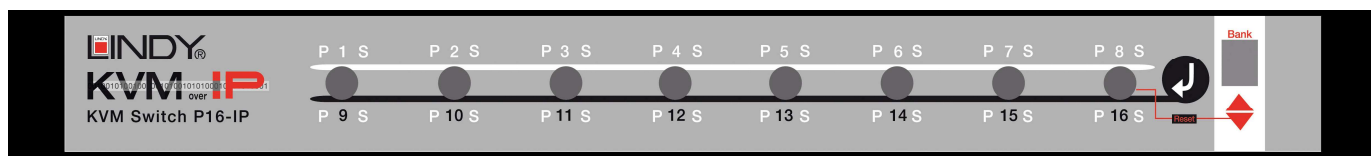
Port LED Display

The front panel of the switch has two LEDs for each port.

When the LED labelled “**P**” is illuminated **GREEN** a computer attached to this port is powered on. When the LED labelled “**S**” is illuminated **RED**, the KVM console is connected to this port. If this LED flashes, the console is connected to this port but either no computer is attached, or the attached computer is not switched on.

3.1.5 Front panel push button selection

You can select a computer by pressing the appropriate port push button. Each push button refers to two ports. To access ports 1 to 8 simply press the button; to access ports 9 to 16 you must push the button marked “↵” and the required port button simultaneously.

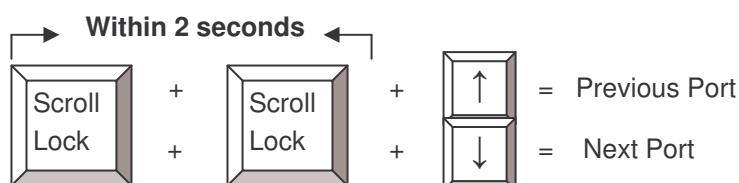


For cascaded KVM Switches you can ONLY use the port selection push buttons on the MASTER P16-IP Switch to switch the SLAVES (you can also switch via OSD or keyboard hotkey).

3.2 Keyboard Hotkey Selection

You can also conveniently select the computer to be accessed and displayed by switching ports through simple keyboard key sequences. To send commands to the KVM switch, **the “SCROLL LOCK” key must be pressed twice within 2 seconds**. You will hear a beep to confirm that the keyboard is in hotkey mode. If you have not pressed any key in hotkey mode within 2 seconds, the keyboard will return back to Operating System control status.

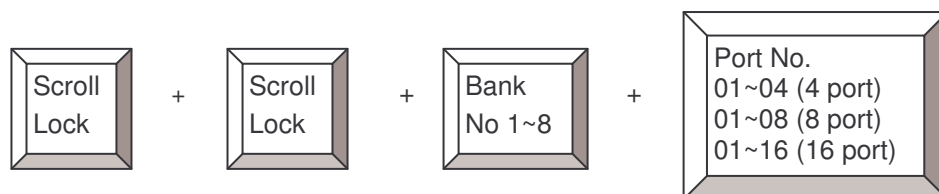
Direct Port Selection / Keyboard Hot Key Commands:



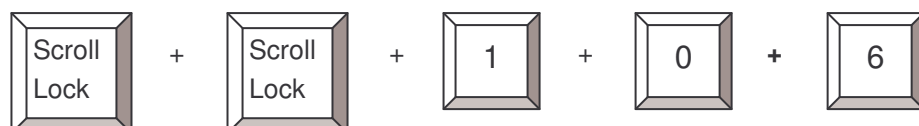
Tip: Hold the arrow key down, or press multiple times, to cycle through the ports

KVM Switch/Bank Selection:

The P16-IP supports cascading of up to 8 KVM Switches (Banks). Therefore, when using direct hotkey port selection you must include the key sequence for the KVM Switch/Bank:



Example: To access a computer attached to Port 6 of the first KVM Switch you should press the following hotkeys:

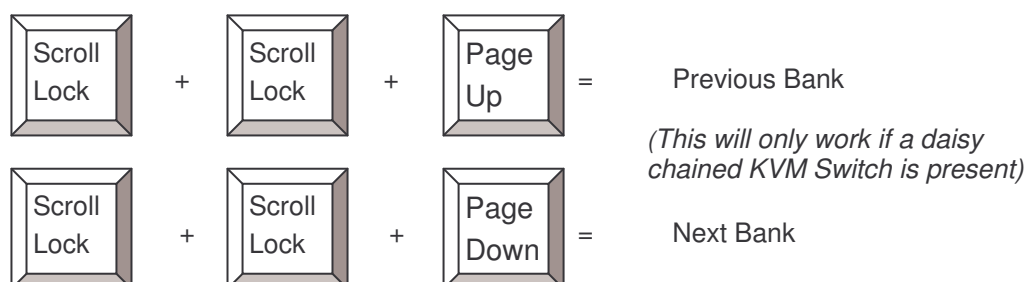


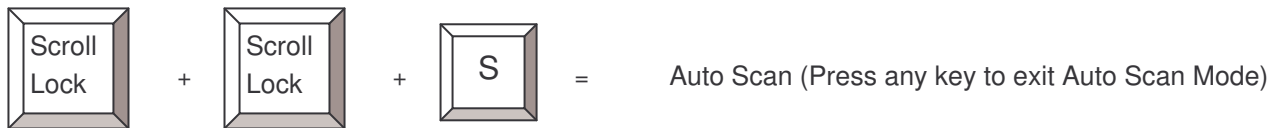
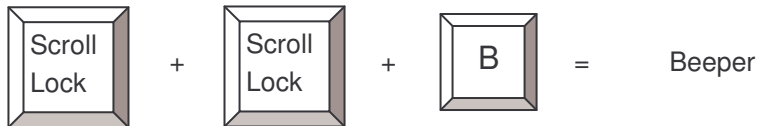
Important Note:

Always keep in mind to include leading zeros for all ports below 10! i.e. **104** for Port 4 of the first switch.

Bank no. and Port no. selection must be made using the numeric keys on the keyboard. Keys on the numeric keypad are not available as hot key commands!

To use hotkey switching to access another KVM Switch / Bank:



Auto Scan mode:**Beeper Function (Enables and Disables beep during Auto Scan):**

3.3 On Screen Display Menu (OSD) Port Selection

The On Screen Display menu provides a lot of information about the P16-IP and the attached computers, and offers advanced administration features and full KVM Switch control to the user.

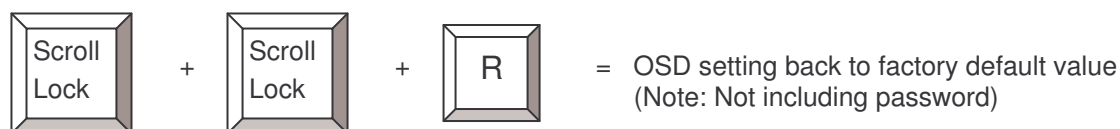
To invoke the On Screen Display Menu press the following hotkeys:



The OSD menu closes down automatically after a specified time period, which can be set in the OSD settings menu. The time selected can be between 5 and 99 seconds

The OSD menu can be invoked even when the P16-IP is currently switched to a port with no connected or a non-powered on PC. In this case the resolution of OSD menu is fixed to a 1024 X 768 virtual frame.

If you wish to, you can restore the factory default values of the OSD. Please note this does not include resetting the password! The bank LED display on the front panel will flash during the memory refresh process.

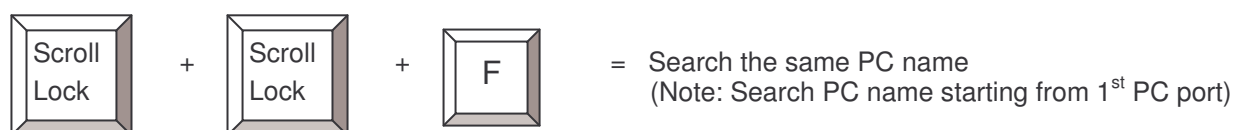


ROM REFLASH

An OSD overlay window will be displayed on the screen during the memory refresh process

When the OSD values have been reset back to factory default, the bank LED on the front panel will stop flashing.

The OSD also allows you to give each attached computer its own name. A name search function is also available from the OSD:



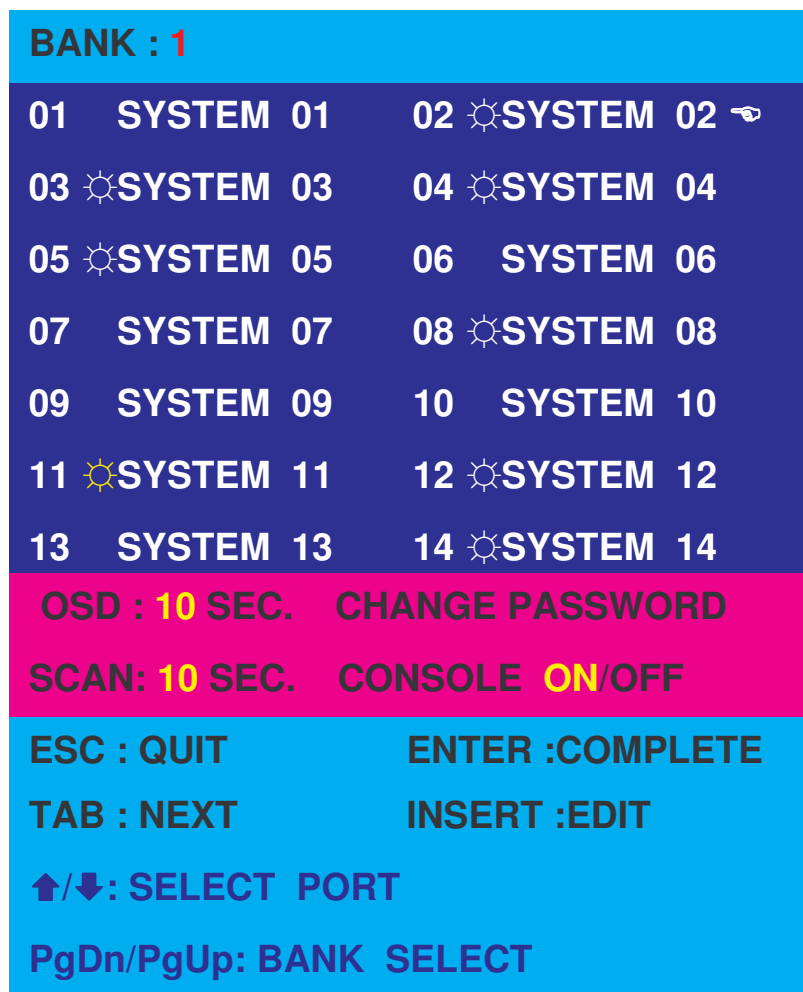
You can type in one character up to a complete name. The upper part of the window will display all computer names that match one by one. You can use the UP/DOWN cursor keys to toggle through this name list.

Press ENTER to switch to the computer displayed in the upper window.

ESC closes the window

The OSD Menu displays the following screen

a. You can toggle between the 3 parts of the OSD menu (Bank PC names, KVM Switch Settings) using the TAB key. The lower light blue part of the OSD lists keyboard controls.



b. The 1st part of the OSD window line bar is the bank or KVM Switch number

c. The 2nd part (dark blue) is the attached PC name list. You will find the system number list from 01 to 04 (for 4 port version) or from 01 to 08 (for 8 port version) or from 01 to 16 (for 16 port version). You can rename your PCs here (maximum 8 characters). The factory default PC name is "SYSTEM 01", "SYSTEM 02", etc.

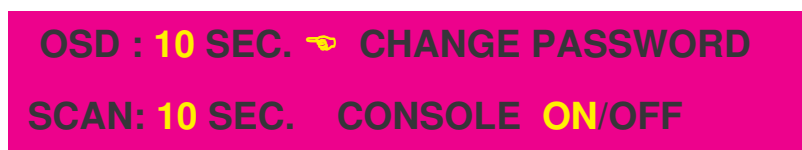
d. The sun symbol "☀" next to the PC name indicates that the attached computer is powered on.

e. You can use the CURSOR keys (up arrow, down arrow, left and right arrow) to select the port you want to access and press the ENTER key to switch.

f. Use the "PgUp" or "PgDn" key to switch to another daisy chained KVM Switch / Bank. This function only works when another KVM Switch/Bank is connected.



g. To change the name of a computer, select the port and press the "INS" key to edit the name. Press the "Enter" key to save it.



h. To access the third part of the OSD containing OSD, SCAN, CHANGE PASSWORD, CONSOLE ON/OFF, etc. press the "TAB" key

The TAB key toggles between the fields. Simply overwrite the fields with your chosen values.

i. **OSD** means that the OSD window is displayed on your monitor for 10 sec. You can modify this value from 05 sec to 99 sec. Default is 10 sec.

j. **SCAN** displays the scan duration per channel in Auto Scan Mode. The default SCAN time is 10 sec., the maximum scan time can be set to 99 sec, it cannot be less than 5 sec.

k. **CONSOLE ON/OFF** is used to prevent unauthorized use of the console. “CONSOLE ON” means that any user can access the console. “CONSOLE OFF” (factory default) means that any user will have to enter the password before getting access. When the password is entered correctly the CONSOLE status will be set to ON. To lock the console again the status has to be changed from CONSOLE ON to OFF via OSD. Also if the current CONSOLE state is ON and you reset the KVM switch, the CONSOLE will be reset to the OFF state.



l. **CHANGE PASSWORD** is used to set a new password. The factory default is 8 digits “00000000”.

To change the password you have to input the old password and then type in the new password twice, to prevent mistyping. The maximum password length is eight digits.



Make sure you do not forget the password. Otherwise you will have to send the KVM Switch to LINDY for maintenance.



Finally you will see the confirmation message that the new password is set.

When you have switched to a certain port on the KVM Switch the keyboard and mouse commands are directed to the attached computer and its monitor signal is displayed on the screen.



In this overlay window from the OSD you will see some basic information for the selected computer / port. The OSD shows the port number; the status of the attached computer - “☀”, to indicate that this computer is online and powered on; and the computer name.

You can close almost any overlay OSD window by simply pressing the ESCAPE key.

Section 4

IP Access Configuration & Operation

4.1 Configuration

The P16-IP's communication interfaces are all based on TCP/IP. The switch comes pre-configured with the IP configuration detailed here:

Parameter	Value
IP auto configuration	DHCP
IP-Address	-
Net-mask	255.255.255.0
Default-Gateway	none

Note: If the DHCP connection fails on boot-up, the P16-IP will not have an IP address.

If this initial configuration does not meet your requirements, the following section describes the configuration that is necessary to access the P16-IP for the first time.

Initial Configuration via a DHCP Server

By default, the P16-IP will try to contact a DHCP server in the subnet to which it is physically connected. If a DHCP server is found, it will provide a valid IP address, gateway address and net mask. Before you connect the device to your local subnet, be sure to complete the corresponding configuration of your DHCP server. It is recommended to configure a fixed IP assignment to the MAC address of the P16-IP. You can find the MAC address labelled on the bottom of the switch.

Use the setup tool to adjust the values to your needs. The setup tool can be found on the supplied CD ROM. Follow the procedure described on the next page (**Section 4.2**)

Initial Configuration via a Serial Console

The P16-IP has a serial line interface (host side) for connecting a serial terminal. This connector is compliant with the RS-232 serial line standard. The serial line has to be configured with the parameters given in this table:

Parameter	Value
Bits/second	115200
Data bits	8
Parity	No
Stop bits	1
Flow Control	None

When configuring with a serial terminal, reset the P16-IP and immediately press the **ESC** key. You will see some device information and a "=>" prompt. Type **config** and press the **Enter** key. Wait a few seconds for the configuration questions to appear.

As you proceed, the following questions will appear on the screen. To accept the default values (shown in square brackets below) press the **Enter** key.

IP auto configuration (non/dhcp/bootp) [dhcp]:
IP [192.168.1.22]:
Net mask [255.255.255.0]:
Gateway (0.0.0.0 for none) [0.0.0.0]:

4.2 P16-IP Setup Tool

MAC Address Detection

Connect the P16-IP to your computer either via a local network, or via USB. If you use a USB connection Windows will detect the P16-IP as a '**Removable Disk**' and an appropriate drive letter will be assigned.



psetup

Start the setup tool from the CD ROM.

A window opens as shown below:

On the upper left corner of the window, the MAC address of the P16-IP is displayed. To detect the MAC address, press the **Refresh Devices** button. The displayed MAC address is the same as that printed on the label on the base of the unit.

On the lower right corner of the window, there are two buttons: **Query Device** and **Setup Device**. Press the **Query Device** button to display the preconfigured values of the network configuration. The values are displayed in the text fields located above. If necessary, adjust the network settings to your needs. To save the changes enter a user login and a password (*see Authentication, on page 22*) and then press the **Setup Device** button.

Authentication

To adjust the authentication settings, enter your login as a super user and change your password.

Super user login

Enter the login name of the super user. The initial value is **super**. All of the characters are lower case.

Super user password

Enter the current password for the super user. This initial value is **pass**. All of the characters are lower case.

New super user password

Enter the new password for the super user.

New password (confirm)

Re-type the new password for the super user.

To close the window and accept the changes, press the **OK** button, otherwise press the **Cancel** button.

IP Auto Configuration

With this option, you can specify whether the P16-IP should obtain its network settings from a DHCP or BOOTP server. From the drop down list select either **DHCP** or **BOOTP**. If you select **NONE**, the IP auto configuration is disabled and you should manually input the following network settings:

IP address

The IP address the P16-IP uses.

Net mask

The net mask of the connected IP subnet.

Gateway address

The IP address of the default router for the connected IP subnet. If you do not have a default router, enter **0.0.0.0**.

4.3 Keyboard, Mouse and Video Configuration

Between the P16-IP and the host, there are two interfaces available for transmitting keyboard and mouse data: USB and PS/2. The correct operation of the remote mouse depends on several settings which will be discussed in the following subsections. Please see **page 30** for details of how to make the specific changes to the mouse settings described below.

P16-IP Keyboard Settings

The P16-IP settings for the host's keyboard type have to be correct in order to make the remote keyboard work properly. The settings can be checked using the P16-IP front-end (**see page 33**)

Remote Mouse Settings

A common problem with KVM devices is the synchronization between the local and remote mouse cursors. The P16-IP addresses this problem with an intelligent synchronization algorithm. There are two mouse modes available on the P16-IP: **Auto mouse speed** and **Fixed mouse speed**.

Auto mouse speed

The automatic mouse speed mode tries to detect the speed and acceleration settings of the host system automatically. Speed detection is performed during mouse synchronization. If the mouse does not move correctly, there are two ways to re-synchronize the local and remote mouse:

Fast Sync: Fast synchronization is used to correct a temporary, but fixed skew. Choose this option using the Remote Console options menu or by pressing the mouse synchronization hotkey sequence - **[ALT] + [F12]**

Intelligent Sync: If the fast sync does not work correctly or the mouse settings have been changed on the host system, you can use the intelligent resynchronization option. This method can be accessed from the **Mouse Handling** sub menu of the Remote Console **Option** menu.

Intelligent synchronization requires a correctly adjusted picture. Use the auto adjustment function or manual correction in the Video Settings panel to setup the picture. **The Sync mouse button on top of the Remote Console can behave differently, depending on the current state of mouse synchronization.** Usually pressing this button leads to a fast sync, except in situations where the KVM port or the video mode was recently changed.

Tip: When first started, if the local mouse pointer is not synchronized with the remote mouse pointer, click the **Auto Adjust Button** once. If the mouse is still not synchronized select **Intelligent Sync** from the **Mouse Handling** sub menu of the Remote Console **Option** menu.

Fixed mouse speed

This mode just translates the mouse movements from the Remote Console in a way that one pixel move will lead to 'n' pixel moves on the remote system. This parameter 'n' is adjustable. However, it should be noted that this works only when mouse acceleration is turned off on the remote system.

Host System Mouse Settings

The host's operating system obtains various settings from the mouse driver.

Note: The following limitations do not apply when using USB mice and Windows 2000 and higher!

Special Mouse Driver

There are mouse drivers which influence the synchronization process and lead to desynchronized mouse pointers. If this happens, make sure you do not use a special vendor-specific mouse driver on your host system.

Windows XP Mouse Settings

If using Windows XP, disable the **enhance pointer precision** setting.

Active Desktop

If the Active Desktop feature of Microsoft Windows is enabled, do not use a plain background. Instead, use some kind of wallpaper. Alternatively, you could also disable the Active Desktop completely.

Navigate your mouse pointer into the upper left corner of the applet screen and move it back and forth slightly. In this way the mouse will be resynchronized. If re-synchronizing fails, disable mouse acceleration and repeat the procedure.

Single and Double Mouse Mode

The information above applies to **Double Mouse Mode**, where both remote and local mouse pointers are visible and need to be synchronized. The P16-IP also features another mode - **Single Mouse Mode**, where only the remote mouse pointer is visible. Activate this mode in the open Remote Console and click into the window area. The local mouse pointer will be hidden and the remote one can be controlled directly. To leave this mode, use the hotkey combination **[ALT] + [F12]** to free the captured local mouse pointer.

Recommended Mouse Settings

For the different operating systems we can give the following advice...

MS Windows 2000/2003 (Professional and Server), XP

In general, we recommend the use of a USB mouse. Choose USB without Mouse Sync. For a PS/2 mouse choose Auto Mouse Speed. For XP disable the option called **enhance pointer precision** in the Control Panel.

SUN Solaris

Adjust the mouse settings either via **xset m 1** or use the CDE Control Panel to set the mouse to 1:1, no acceleration. As an alternative you may also use the Single Mouse Mode.

MAC OS X

We recommend using the Single Mouse Mode.

Video Modes

The P16-IP switch recognizes a limited number of common video modes. When running X11 on the host system, please do not use any custom mode lines with special video modes. If you do, the P16-IP switch may not be able to detect them. We recommend using any of the standard VESA video modes instead.

4.4 Usage

Prerequisites

The P16-IP features an embedded operating system offering a variety of standardized interfaces. This section will describe these interfaces, and the way to use them in a more detailed manner. The interfaces are accessed using the TCP/IP protocol family.

The following interfaces are supported:

Telnet

A standard Telnet client can be used to access an arbitrary device connected to the P16-IP's serial port via a terminal.

HTTP/HTTPS

Full access is provided by the embedded web server. The P16-IP switch environment can be entirely managed using a standard web browser. You can access the P16-IP using the insecure HTTP protocol, or using the encrypted HTTPS protocol. Whenever possible, use HTTPS.

The primary interface of the P16-IP is the HTTP interface. This is covered extensively in this section. Other interfaces are addressed in the relevant subsections.

In order to use the Remote Console window of your managed host system, the browser must feature Java Runtime Environment version 1.1 or higher support. If the browser has no Java support (such as on a small handheld device), you can still maintain your remote host system using the administration forms displayed by the browser itself.

Important: We recommend you install the latest version of Sun's Java Virtual Machine which can be downloaded from the following web site:

www.java.com

For a non-secure connection to the P16-IP, we recommend the following browsers:

- Microsoft Internet Explorer version 6.0 or higher
- Netscape Navigator 7.0 or Mozilla 1.6

In order to access the remote host system using a securely encrypted connection, you need a browser that supports the HTTPS protocol. Strong security is only assured by using a key length of 128 Bit. Some older browsers do not have a strong 128 Bit encryption algorithm.

4.5 Logging In

Login to the P16-IP

Launch your web browser. Direct it to the address of your P16-IP which you configured during the installation process. The address used might be a plain IP address or a host and domain name if you have given your P16-IP switch a symbolic name in the DNS.

Example: Type the following in the address line of your browser when establishing an unsecured connection:

http://<IP address of P16-IP>

When using a secure connection, type in:

https://<IP address of P16-IP>

This will lead you to the P16-IP login page as shown below:



The P16-IP has a built-in super user account that has all the permissions enabled to administrate your P16-IP switch:

Login name	super (factory default)
Password	pass (factory default)

Please note: Your web browser has to accept cookies, or else login is not possible.

Note: The user “super” is not allowed to login via the serial interface of the IP-KVM switch.

Please make sure you change the super user password immediately after you have installed and accessed your P16-IP for the first time. Not changing the password for the super user is a severe security risk and could result in unauthorized access to the switch and to the host system(s) to which it is connected.

4.6 Navigation

Once logged into the P16-IP successfully, the main page appears. This page consists of three parts; each of them contains specific information. The buttons in the upper area allow you to navigate within the front end. The lower left area contains a navigation bar and allows you to switch between the different sections of the P16-IP. Within the main area, task-specific information is displayed.



Home

Return to the main page of the P16-IP



Logout

Logout from the P16-IP



Console

Access the Remote Console

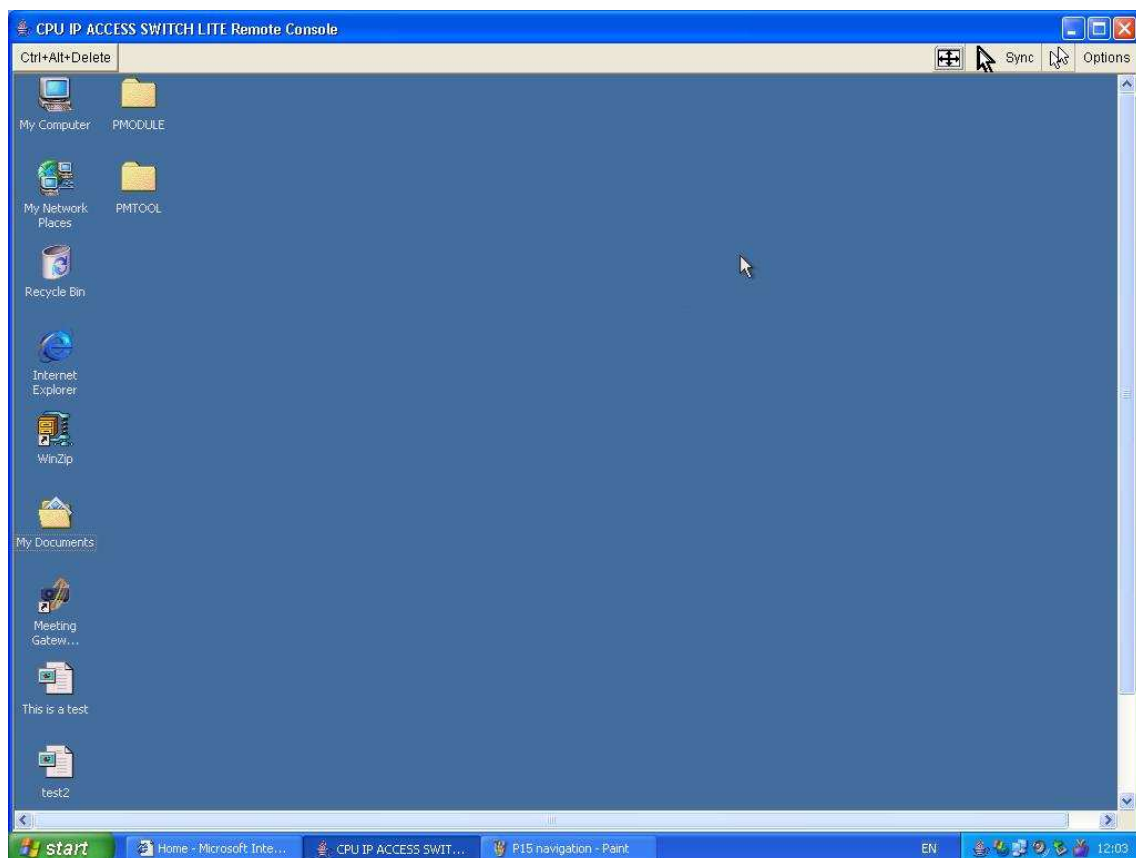
The Remote Console is the redirected screen, keyboard and mouse of the remote host system that the P16-IP switch controls. Selecting this button opens the **Remote Console Main Window**.

The Remote Console window is a Java Applet that establishes its own TCP connection to the P16-IP. The protocol that runs over this connection is neither HTTP nor HTTPS, but RFB (Remote Frame Buffer Protocol). RFB needs to establish a connection to port number 443. Your local network environment has to allow this connection to be made, i.e. your firewall and, if you have a private internal network, your NAT (Network Address Translation) settings have to be configured accordingly.

If the P16-IP is connected to your local network environment and your connection to the Internet is available using a proxy server only, without NAT being configured, the Remote Console is very unlikely to be able to establish a connection. This is because today's web proxies are not capable of relaying the RFB protocol.

If you experience problems, please consult your network administrator in order to provide an appropriate network environment.

Remote Console Main Window



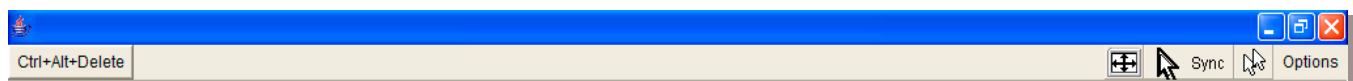
Starting the Remote Console opens an additional window. It displays the screen content of the currently selected computer connected to the P16-IP. The Remote Console will behave in exactly the same way as if you were using the local console. You can use the P16-IP keyboard hotkeys to switch between computers, activate the OSD etc., as well as control the currently selected computer. However, be aware that the host system will react to keyboard and mouse actions with a slight delay.

Note: Your local keyboard changes its keyboard layout according to the remote host system. If you use a German administration system and your host system uses a US English keyboard layout for instance, some special keys on the German keyboard will not work as expected. Instead, the keys will result in their US English counterpart. You can circumvent such problems by adjusting the keyboard of your remote system to the same mapping as your local one.

The Remote Console window always tries to show the remote screen with its optimal size. That means it will adapt its size to the size of the remote screen initially and after the screen resolution of the remote screen has been changed. However, you can always resize the Remote Console window in your local window system as usual.

Remote Console Control Bar

The upper part of the Remote Console window contains a control bar. Using its elements you can see the state of the Remote Console and influence the local Remote Console settings. A description for each control follows.



Ctrl+Alt+Delete

Sends the 'Control Alt Delete' key combination to the remote system

Auto Adjust button

If the video display is poor quality or distorted in some way, click this button and wait a few seconds while the P16-IP tries to adjust itself for the best possible video quality.

Sync mouse

Activates the mouse synchronization process. Choose this option in order to synchronize the local AND remote mouse cursors. This is especially necessary when using accelerated mouse settings on the host system. In general, there is no need to change mouse settings on the host.

Single/Double mouse mode

Switches between the Single Mouse Mode (where only the remote mouse pointer is visible) and the Double Mouse Mode (where remote and local mouse pointers are visible) Single mouse mode is only available if using SUN JVM 1.3 or higher.

Tip: When in single mouse mode use the hotkey combination [ALT] + [F12] to release mouse control and access the menus etc.

Options**Options**

Opens the Options menu. A short description of the each of the options follows:

Monitor Only

Toggles the 'Monitor Only' filter on or off. If the filter is switched on, no remote console interaction is possible but monitoring is.

Exclusive Access

If a user has the appropriate permission, he can force the Remote Consoles of all other users to close. No one can open the Remote Console at the same time again until this user disables the exclusive access, or logs off.

A change in the access mode is also visible in the status line indicated by this icon.

**Scaling**

Allows you to scale down the Remote Console. You can still use both mouse and keyboard; however the scaling algorithm will not preserve all display details.

Mouse Handling

The submenu for mouse handling offers two options for synchronizing the local and the remote mouse pointer.

Fast Sync

The fast synchronization is used to correct a temporary, but fixed skew.

Intelligent Sync

Use this option if the fast sync does not work or the mouse settings have been changed on the host system

Note: This method takes more time than fast sync and requires a correctly adjusted picture. Use the auto adjustment function or the manual correction in the Video Settings panel to setup the picture.

Local Cursor

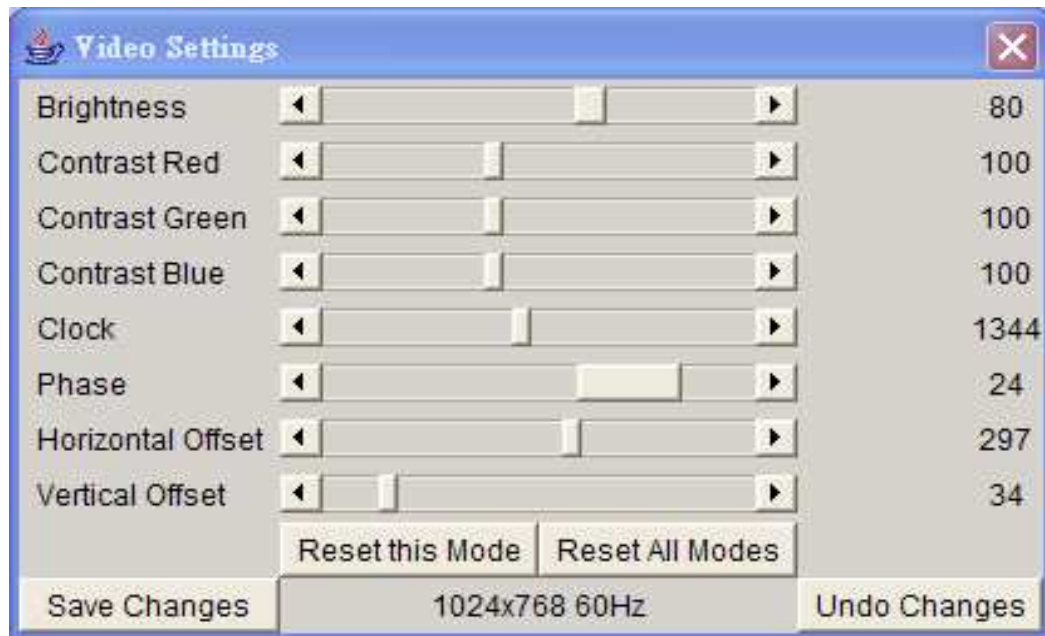
Offers a list of different cursor shapes to choose from for the local mouse pointer. The selected shape will be saved for the current user and activated the next time this user opens the Remote Console. The number of available shapes depends on the Java Virtual Machine; a version of 1.2 or higher offers the full list.

Video Settings

Opens a panel for changing the P16-IP video settings. The P16-IP features two different dialogs, which influence the video settings:

Video Settings in the KVM section in the front end menu:

The Noise Filter option defines how the P16-IP reacts to small changes in the video input signal. A large filter setting needs less network traffic and leads to a faster video display, but small changes in some display regions may not be recognized immediately. A small filter displays all changes instantly but may lead to a constant amount of network traffic even if display content is not really changing (depending on the quality of the video input signal). All in all the default setting should be suitable for most situations.

Video Settings through the remote console:**Brightness**

Controls the brightness of the picture

Contrast

Controls the contrast of the picture

Clock

Defines the horizontal frequency for a video line and depends on the video mode. Different video card types may require different values here. The default settings in conjunction with the auto adjustment procedure should be adequate for most common configurations. If the picture quality is still bad after auto adjustment you may change this setting together with the sampling phase to achieve a better quality.

Phase

Defines the phase for video sampling; used to control the display quality together with the setting for sampling clock.

Horizontal Offset

Use the left and right buttons to move the picture in a horizontal direction

Vertical Offset

Use the left and right buttons to move the picture in a vertical direction

Reset this Mode

Reset mode specific settings to the factory-made defaults.

Reset all Modes

Reset all settings to the factory-made defaults.

Save Changes

Save changes permanently

Undo Changes

Restore last settings

Soft Keyboard

Opens up the sub-menu for the Soft-Keyboard:

Show

Pops up the Soft-Keyboard. The Soft-Keyboard is necessary in case your host system runs a completely different language and country mapping than your administration machine.

**Mapping**

Used for choosing the language and country mapping of the Soft-Keyboard.

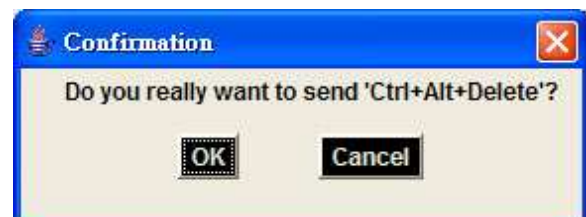
Local Keyboard

Used to change the language mapping of your browser running the Remote Console Applet. Normally, the applet determines the correct value automatically. However, depending on your particular KVM and your browser settings this is not always possible. A typical example is a German localized system that uses a US-English keyboard mapping. In this case you must manually change the local keyboard setting to the correct language.

Hotkeys

Opens a list of previously defined hotkeys. Choose one entry; the command will be sent to the host system.

A confirmation dialog can be added that will be displayed before sending the selected command to the remote host. Select **OK** to perform the command on the remote host.



Remote Console Status Line

Status line

Shows both console and the connection state. The size of the remote screen is displayed. The example below was taken from a Remote Console with a resolution of 1024 x 768 pixels. The value in brackets describes the connection to the Remote Console. **Norm** means a standard connection without encryption, **SSL** indicates a secure connection.

Console(Norm): Desktop size is 1024 x 768

In: 0 B/s Out: 0 B/s



Furthermore, both the incoming (**In:**) and the outgoing (**Out:**) network traffic are visible (in kb/s). If compressed encoding is enabled, a value in brackets displays the compressed transfer rate.

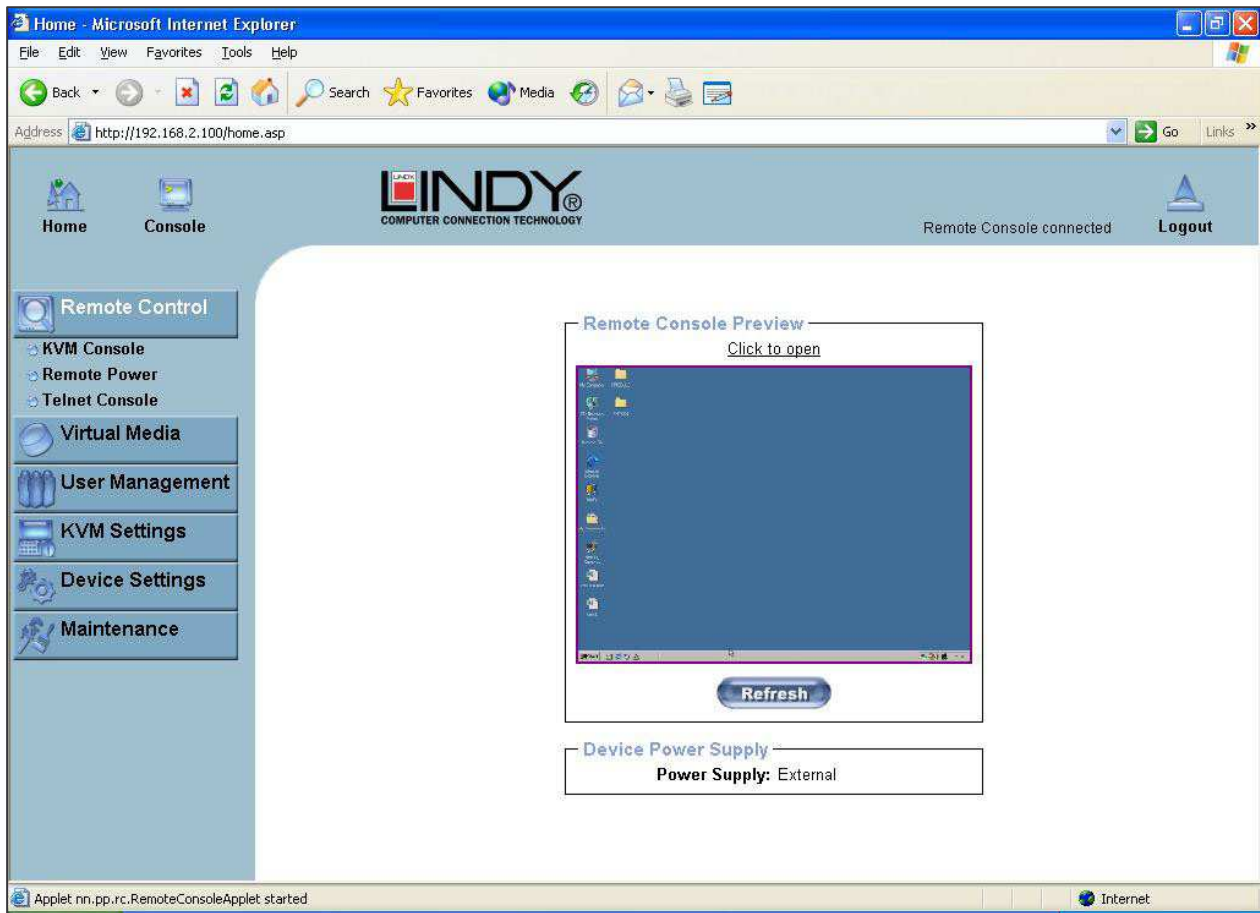
In: 0 B/s Out: 0 B/s

For more information about **Monitor Only** and **Exclusive Access** settings, see the relevant sections on page 31.

4.7 Menu Options

4.7.1 Remote Control

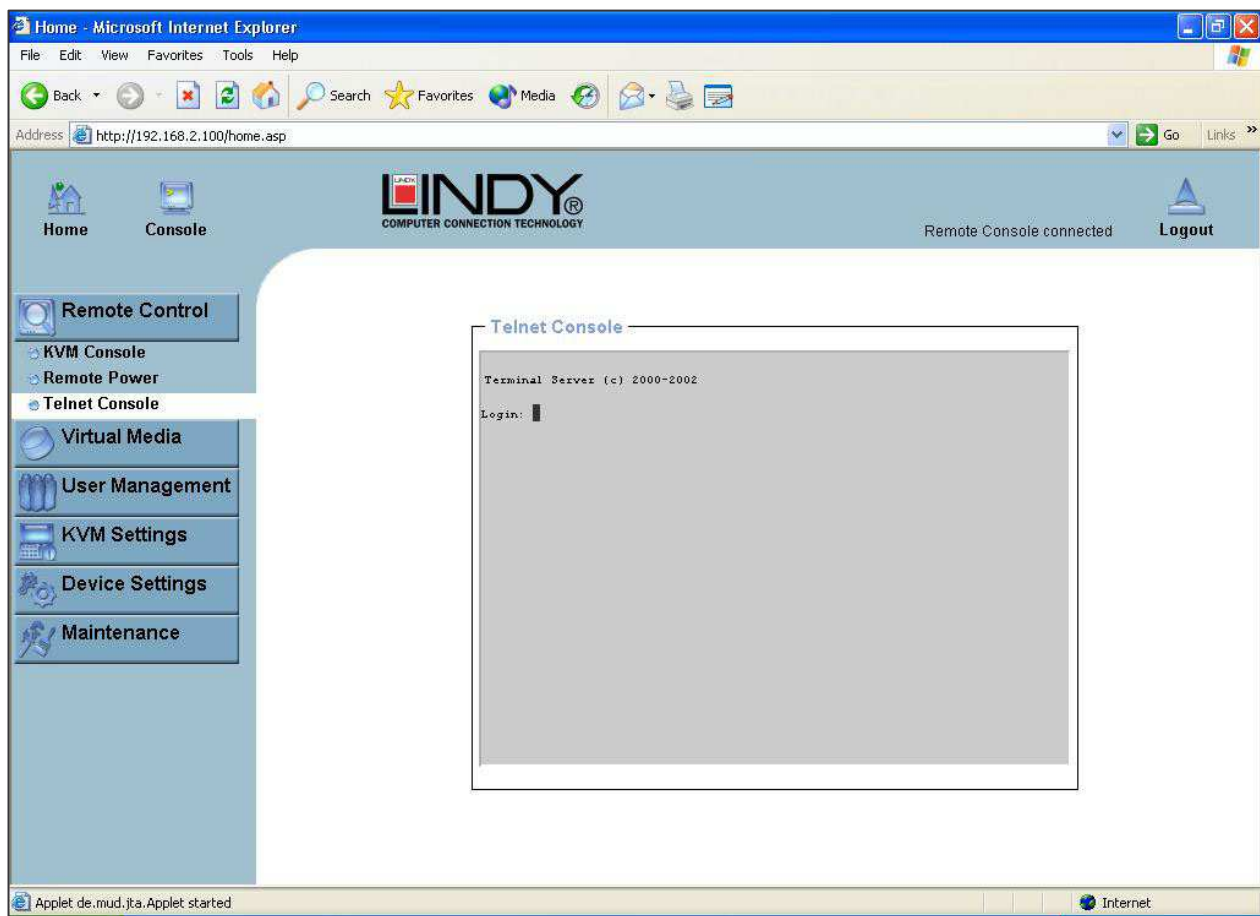
KVM Console



To open the KVM console, click either the menu entry on the left or on the console picture on the right. To refresh the picture, click on the **Refresh** button.

For the **Remote Power** settings see *Section 2.3 on page 9*.

Telnet Console



The P16-IP firmware features a Telnet server that enables a user to connect via a standard Telnet client. If the Telnet program is using a VT 100, VT 102 or VT 220 terminal or appropriate emulation, it is even possible to perform a console redirection, as long as the P16-IP host is using a text mode screen resolution.

Connecting to the P16-IP is done as usual and as required by the Telnet client, for instance in a UNIX shell:

telnet 192.168.1.22

Replace the IP address by the one that is actually assigned to the P16-IP. This will prompt for the username and password in order to log into the device. The credentials that need to be entered for authentication are identical to those of the web interface. That means the user management of the Telnet interface is entirely controlled with the appropriate functions of the web interface.

Once you have successfully logged into the P16-IP a command line will be presented and you can enter management commands.

In general, the Telnet interface supports two operation modes: the command line mode and the terminal mode. The command line mode is used to control or display some parameters. In terminal mode the pass-through access to serial port 1 is activated (if the serial settings were made accordingly). All inputs are redirected to the device on serial port 1 and its answers are displayed on the Telnet interface.

The following list shows the command mode syntax and usage.

Help

Displays the list of possible commands

Cls

Clears the screen

Quit

Exits the current session and disconnects from the client

Version

Displays the release information

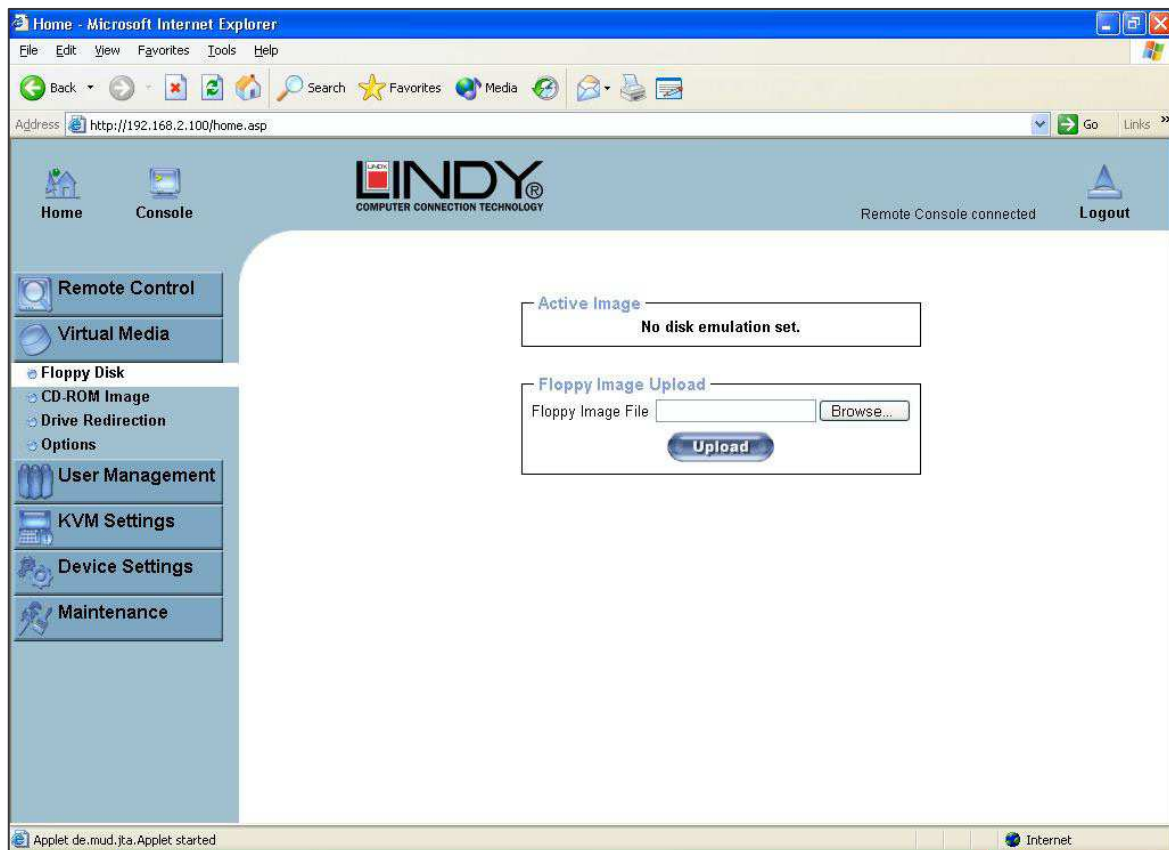
Terminal

Starts the terminal pass-through mode for the serial port. The key sequence 'esc exit' switches back to the command mode.

4.7.2 Virtual Media

One of the computers connected to the P16-IP can also be set up for remote mass storage via a USB connection. Files can be uploaded to the switch, which the host computer 'sees' as virtual drives. This means the remote operator can remotely install software, drivers etc. without the need to be sat in front of the host computer.

Floppy Disk



Follow the steps below to upload a virtual floppy image to the P16-IP and create a virtual floppy drive on the host system.

Create a Floppy Image

First, on your client PC you must create an image of your floppy disk which can be uploaded to the P16-IP's built in memory.

UNIX and UNIX-like OS

To create an image file, make use of **dd**. This is one of the original UNIX utilities and is included in every UNIX-like OS (UNIX, Sun Solaris, Linux).

To create a floppy image file copy the contents of a floppy to a file. You can use the following command:


```
dd [ if=/dev/fd0 ] [ of=/tmp/floppy.image ]
```

dd reads the entire disc from the device **/dev/fd0** and saves the output in the specified output file **/tmp/floppy.image**. Adjust both parameters exactly to your needs (input device etc.)

Windows

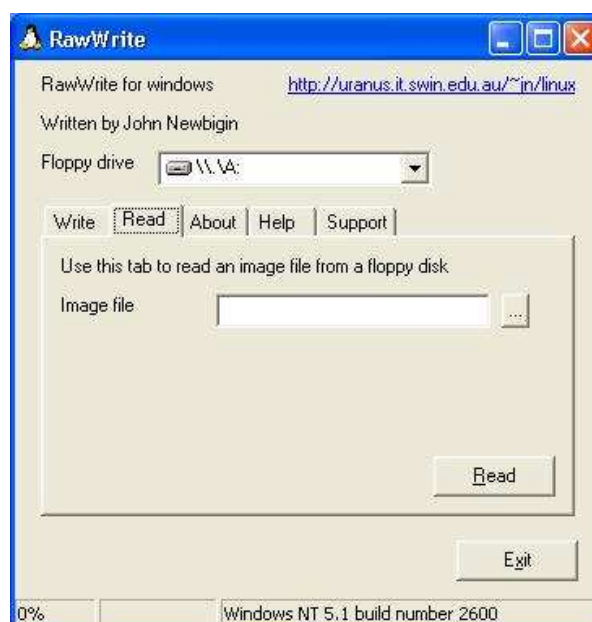
Windows users should use the tool, **RawWrite for Windows**, which is included on the supplied CD.

Launch **RawWrite**, you will see the window opposite:

Insert your floppy disk into your floppy drive. Click the **Read** tab and then click on 

Select a name and destination for the floppy image file and click the **Read** button. As the image is written, you will see the progress as a percentage figure in the bottom left hand corner.

When the image has been written you can upload it to the P16-IP.



Uploading a Floppy Image

Click the **Browse** button and navigate to the location of the image file, then click the **Upload** button.



After the image has uploaded you will see the dialog below:

Floppy image uploaded successfully.



A virtual floppy drive will be installed on the host system and the image will be downloaded to the virtual floppy drive from the P16-IP. You can access the virtual floppy drive in the same way you would a regular drive.

You can download the image from the P16-IP to your remote system by clicking the **Download** button.

Clicking **Discard** removes the virtual floppy image from the P16-IP and from the hosts system.

Create a CD-ROM/ISO Image



Follow the procedure below to create a CD-ROM image which can be accessed by the host system via the P16-IP. The image file must be an ISO file format!

First, on your client PC you must create an image of your CD which can be accessed by the host system.

UNIX and UNIX-like OS

To create an image file, make use of **dd**. This is one of the original UNIX utilities and is included in every UNIX-like OS (UNIX, Sun Solaris, Linux).

To create a CD-ROM image file, copy the contents of the CD-ROM to a file. You can use the following command:

```
dd [ if=/dev/cdrom ] [ of=/tmp/cdrom.image ]
```

dd reads the entire disc from the device **/dev/cdrom**, and saves the output in the specified output file **/tmp/cdrom.image**. Adjust both parameters exactly to your needs (input device etc.).

Windows

To create the image file, use your favourite CD imaging tool. Copy the whole contents of the disc into one single image file on your hard disk.

For example, with 'Nero' choose 'Copy and Backup'. Then, navigate to the 'Copy Disc' section. Select the CD ROM or DVD drive you would like to create an image from. Specify the filename of the image, and save the CD ROM content in that file.



Example:

1. Create a CD image and name it **image.iso**
2. Create a folder on your client PC and name it **Test**. Copy the file **image.iso** to the folder **Test**.
3. Now you need to 'share' this folder. Right click on the folder and select the option **Sharing and Security**. Select **Share this folder** and ensure the **Share Name** is set to **Test**. Click **Permissions** to set permissions for users who access this folder, according to your requirements. Click **Apply** then **OK** to complete.
4. Next you need to mount the image via a Windows Share. In the P16-IP menu on the left hand side of the browser select **Virtual Media** and from the sub menu select **CD-ROM Image**.



5. Input the following parameters:

Share host:	Enter the IP address of your Console PC here (e.g. 192.168.2.103)
Share name:	Test (The share name of the previously created folder)
Path to image:	image.iso (the name of the CD image)
User:	super (Your user name, the default is super)
Password:	pass (Your password, the default is pass)

6. Click **Set**

7. You will see the dialog below detailing the active image:

Image file set successfully

Active Image

CD-ROM Image

Image Host: 192.168.2.104

Image Share: Test

Image File with Path: image.iso

User name: super

Password: not displayed

Reactivate **Unset**

Image on Windows Share

Share host

Share name

Path to image

User (optional)

Password (optional)

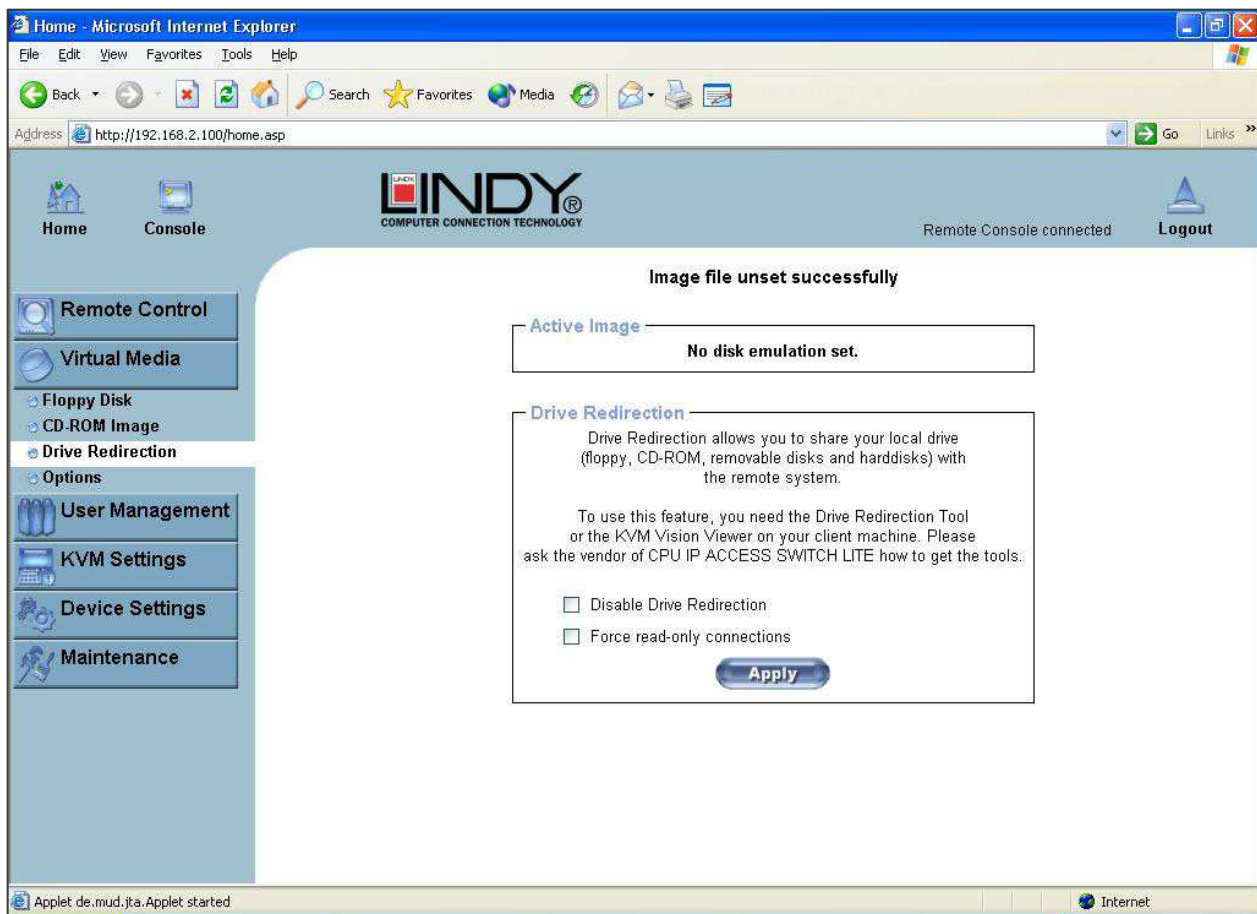
You must remove the current virtual disk to install a CD-ROM image.

8. Click **Reactivate**. Access the console window and you will see that another CD drive has been installed on the host computer. This is the virtual drive you have just set up. You can access the uploaded CD image as though it were a regular CD. Click **Unset** to remove the image.

SAMBA

If you would like to access the share via SAMBA, SAMBA must be set up properly. You may either edit the SAMBA configuration file `/etc/samba/smb.conf`, or use the Samba Web Administration Tool (SWAT) or WebMin to set the correct parameters.

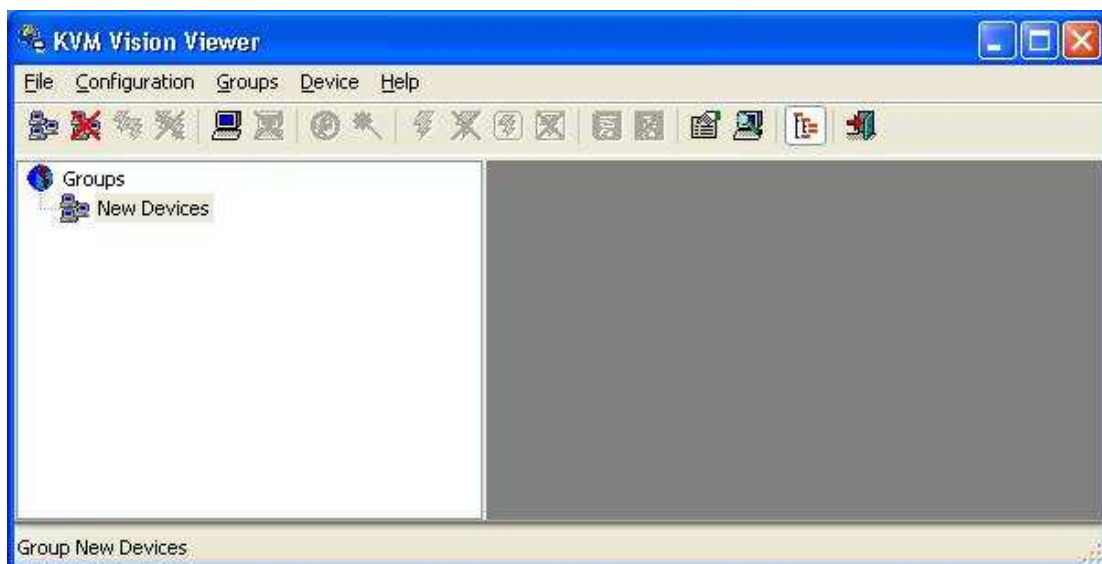
Drive Redirection




The Drive Redirection feature allows the host system to access the CD-Rom drives, hard drives, floppy drives etc. on your client PC.

To use this feature you need the Drive Redirection Tool which is part of the **KVM Vision Viewer** application included on the supplied CD.

1. To set up Drive Redirection, first install **KVM Vision Viewer**. After installation launch the application:



2. Click on the **Search for new devices** icon -  The P16-IP will be detected as an **Unconfigured device** and its MAC address will be displayed in the left panel. Double click on the MAC address to launch the **Device Configuration Wizard**.
3. Follow the on-screen instructions. You will be asked to input your user name (default is **super**) and password (default is **pass**).



Device Configuration Wizard

Super User Login
Please login to setup the Device

Please specify the super user login and password here to setup the device.
The network address of the device is: FE:00:00:50:00:29

Username:

Password:

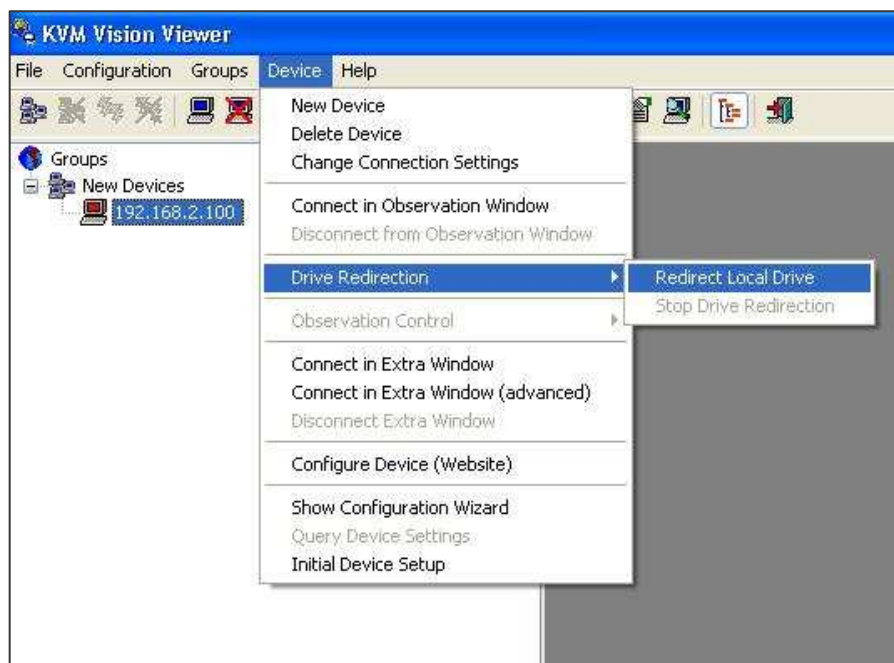
It is strongly recommended that you set a new super user password during the first Device Setup. Please specify the new password below (leave empty if you don't want to set a new password)

New Password:

Confirm Password:

< Back Next > Cancel

4. Continue with the Wizard until the device is correctly configured. Once the configuration is complete, select **Redirect Local Drive** from the **Device** menu:



1. Choose the drive you wish to redirect from the drop-down list. Enter your user name and password and click **OK**.

Warning: Please be aware that if **Allow Write Support** is selected, data on the shared media may be lost!



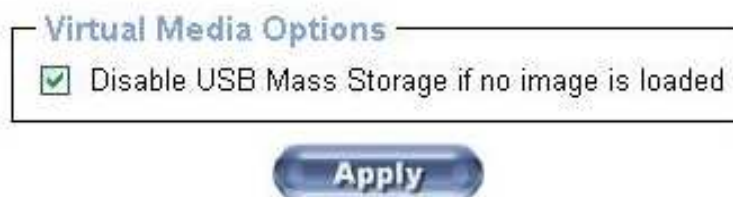
2. Access the host computer from the Remote Console window. You will see that the redirected drive will now be shown in Windows Explorer:



IMPORTANT

1. Drive Redirection is only possible with Windows 2000 and later versions.
2. Drive Redirection works on a low SCSI level. The SCSI protocol cannot recognize partitions; therefore the whole drive selected will be shared instead of any particular partition.

Options

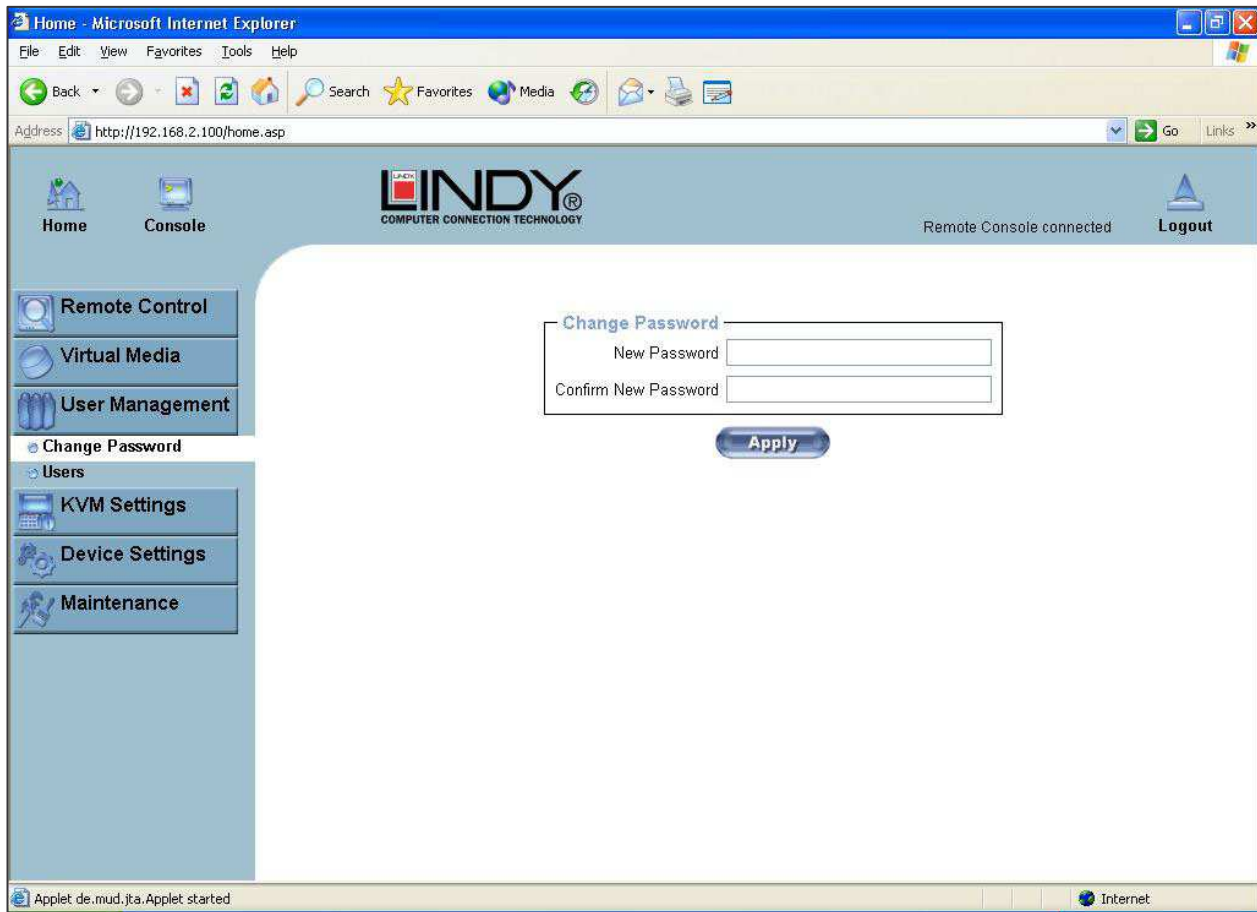


This option allows you to disable the mass storage emulation (and hide the virtual drive) if no image file is currently loaded. To set this option, press the button **Apply**.

4.7.3 User Management

Change Password

To change your password, enter the new password in the upper entry field. Retype the password in the lower field. Click **Apply** to submit your changes.



Users And Groups

The P16-IP comes with 2 pre-configured user accounts that have fixed permissions. The **super** account has all possible rights to configure the device and to use all functions. The **user** account has only the permission to open and use the Remote Console. The default password for both accounts is **pass**. Ensure you change the passwords as soon as you have installed and accessed the P16-IP for the first time.



While the **user** account never sees the following options, the **super** account can change the name and password for both accounts.

Existing users

Select an existing user for modification. Once a user has been selected, click the lookup button to see the user information.

New User name

The new user name for the selected account.

Password

The password for the login name. It must be at least four characters long.

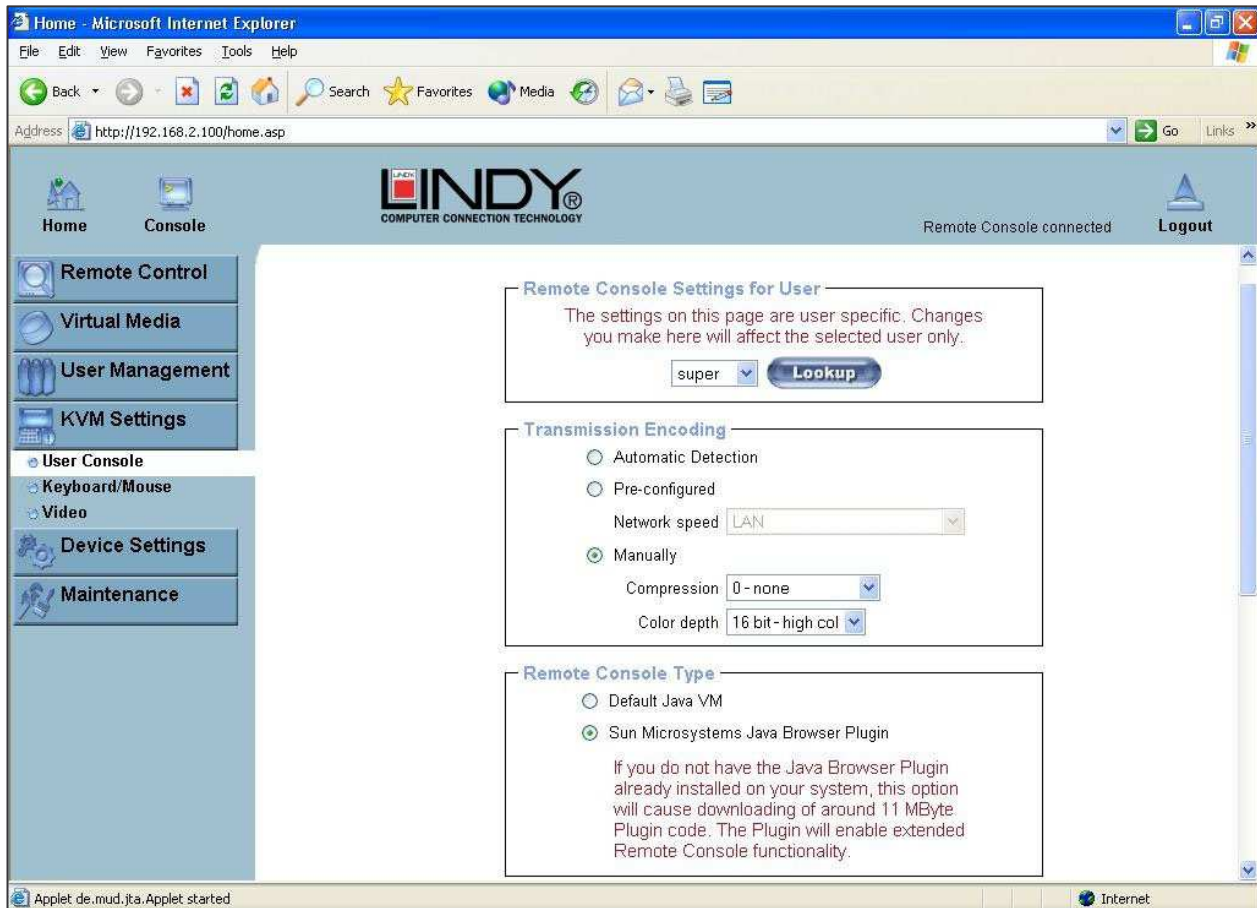
Confirm password

Confirmation of the above password.

4.7.4 KVM Settings

User Console

The following settings are user specific. This means the super user can customize these settings for individual users separately. Changing the settings for one user does not affect the settings for the other users.



User select box

This box displays the user ID for which the values are shown and for which the changes will take effect. You may change the settings of other users if you have the necessary access rights.

Transmission Encoding

The Transmission Encoding setting allows changing the image-encoding algorithm that is used to transmit the video data to the Remote Console window. It is possible to optimize the speed of the remote screen depending on the number of users working at the same time and the bandwidth of the connection line (Modem, ISDN, DSL, LAN, etc.).

Automatic detection

The encoding and the compression level are determined automatically from the available bandwidth and the current content of the video image.

Pre-configured

The pre-configured settings deliver the best result because of optimized adjustment of compression and colour depth for the indicated network speed.

Manually

Allows adjustment of both compression rate and colour depth individually. Depending on the selected compression rate the data stream between the P16-IP and the Remote Console will be compressed in order to save bandwidth. Since high compression rates are very time consuming, they should not be used when several users are accessing the P16-IP simultaneously.

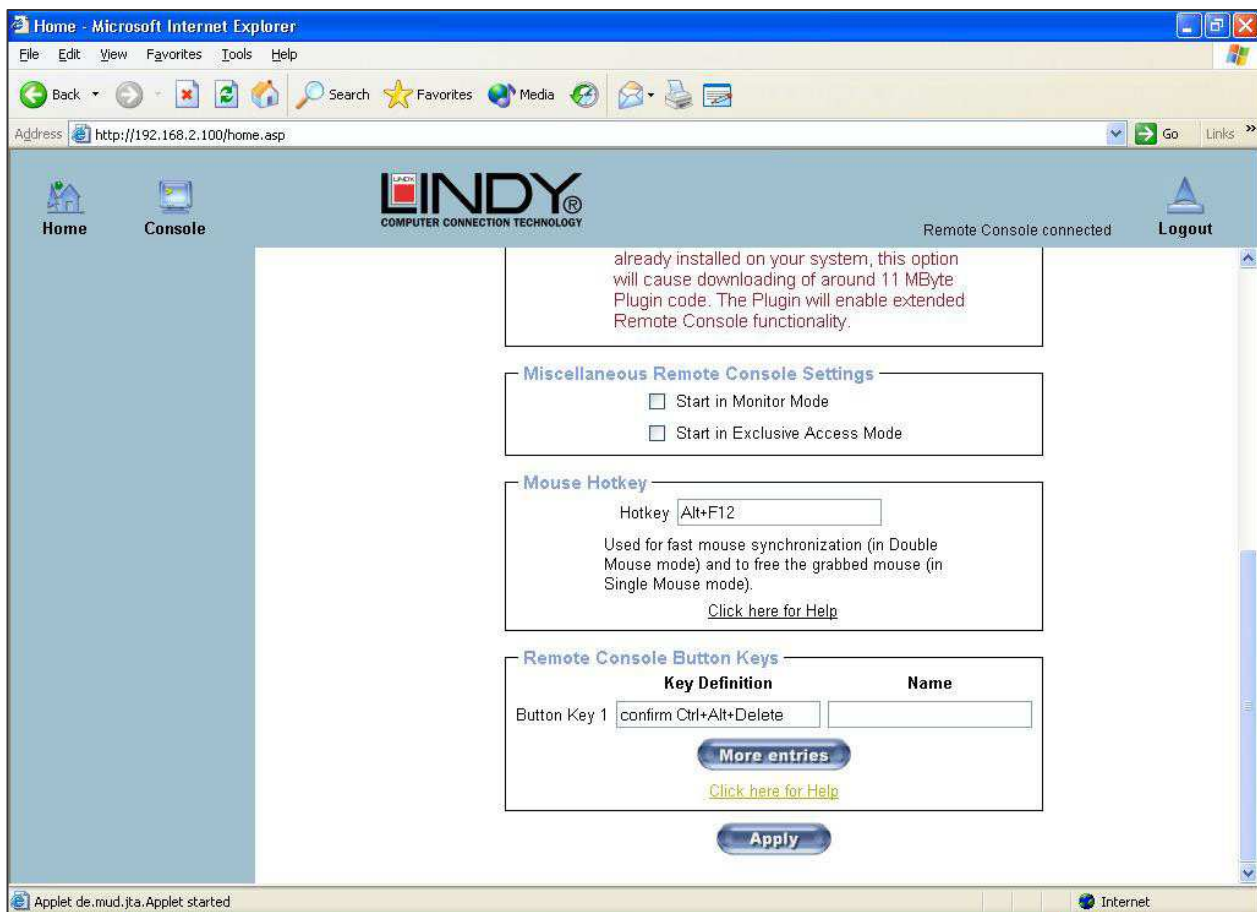
The standard colour depth is 16 bit (65536 colours). The other colour depths are intended for slower network connections in order to allow a faster transmission of data. Therefore compression level 0 (no compression) uses only 16 bit colour depth. At lower bandwidths only 4 bit (16 colours) and 2 bit (4 grey scales) are recommended for typical desktop interfaces. Photo-like pictures have best results with 4 bit (16 grey scales). 1 Bit colour depth (black/white) should only be used for extremely slow network connections.

Remote Console Type

Specifies, which Remote Console Viewer to use.

Default Java-VM

Uses the default Java Virtual Machine of your Browser. This may be the Microsoft JVM for Internet Explorer or the Sun JVM if it is configured this way. Use of the Sun JVM may also be forced (see below).



Sun Microsystems Java Browser Plugin

Instructs the web browser of your administration system to use Sun's JVM. The JVM in the browser is used to run the code for the Remote Console window which is actually a Java Applet. If you check this box for the first time on your administration system and the appropriate Java plug-in is not already installed on your system, it will be downloaded and installed automatically. However, in order to make the installation possible, you still need to answer the appropriate dialogs with **yes**. The download size is around 11MB. The advantage of downloading Sun's JVM is in providing a stable and identical Java Virtual Machine across different platforms. The Remote Console software is optimized for Sun JVM versions and offers wider range of functionality when run with JVM.

Miscellaneous Remote Console Settings

Start in Monitor Mode Sets the initial value for the monitor mode. By default the monitor mode is off. In case you switch it on, the Remote Console window will be started in a read only mode.

Start in Exclusive Access Mode Enables the exclusive access mode immediately at Remote Console startup. This forces the Remote Consoles of all other users to close. No one can open the Remote Console at the same time again until this user disables the exclusive access or logs off.

Mouse hotkey

Allows the user to specify a hotkey combination which starts either the mouse synchronization process if pressed in the Remote Console or is used to leave the single mouse mode.

Remote Console Button Keys

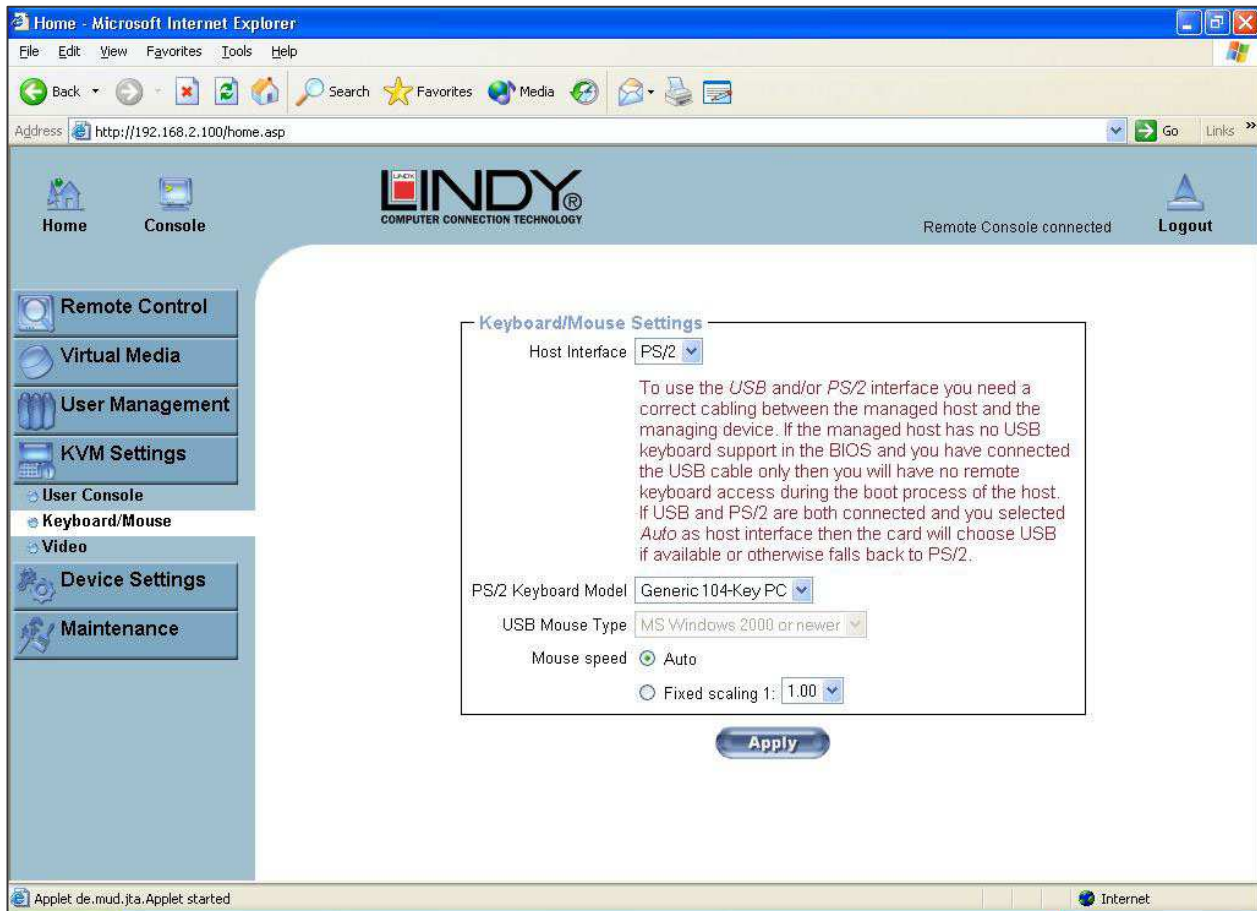
This allows simulating keystrokes on the remote system that cannot be generated locally. The reason for this might be a missing key or the fact that the local operating system of the Remote Console is unconditionally catching this keystroke already. Typical examples are **Control+Alt+Delete** in Windows and DOS, which is always caught, or **Control+Backspace** on Linux for terminating the X-Server. The syntax to define a new Button Key is as follows:

[confirm] <keycode>[+|-[*]<keycode>]*

confirm requests confirmation by a dialog box before the key strokes will be sent to the remote host.

keycode is the key to be sent. Multiple key codes can be joined with a plus, or a minus sign. The plus sign builds key combinations; all keys will be pressed until a minus sign or the end of the combination is encountered. In this case all pressed keys will be released in reversed sequence. So the minus sign builds single, separate key presses and releases. The star inserts a pause with duration of 100 milliseconds.

Keyboard/Mouse



Host Interface

Enables the interface the mouse is connected to. You can choose between **Auto** for automatic detection, **USB** for a USB mouse, or **PS/2** for a PS/2 mouse.

Note: To use the USB and/or PS/2 interface you need the correct cabling between the managed host and the managing device. If the managed host has no USB keyboard support in the BIOS and you have connected the USB cable only, then you will have no remote keyboard access during the boot process of the host. If USB and PS/2 are both connected and you selected **Auto** as host interface, then **USB** will be selected if available, otherwise it will revert to **PS/2**.

To enable USB remote keyboard access during the boot process of the host, the following conditions must be fulfilled:

- the host BIOS must have USB keyboard support
- the USB cable must be connected or must be selected in the Host interface option

PS/2 Keyboard Model

Enables a certain keyboard layout. You can choose between **Generic 101-Key PC** for a standard keyboard layout, **Generic 104-Key PC** for a standard keyboard layout extended by three additional windows keys, **Generic 106-Key PC** for a Japanese keyboard, and **Apple Macintosh** for the Apple Macintosh.

USB Mouse Type

Enables USB mouse type. Choose between **MS Windows 2000 or newer** for MS Windows 2000 or Windows XP, or **Other Operating Systems** for MS Windows NT, Linux, or OS X. In **MS Windows 2000 or newer** mode the remote mouse is always synchronized with the local mouse.

Mouse Speed

- **Auto mouse speed** Use this option if the mouse settings on the host use an additional acceleration setting. The P16-IP tries to detect the acceleration and speed of the mouse during the mouse sync process.
- **Fixed mouse speed** Use a direct translation of mouse movements between the local and the remote pointer.

You may also set a fixed scaling which determines the amount the remote mouse pointer is moved when the local mouse pointer is moved by one pixel. This option only works when the mouse settings on the host are linear. This means that there is no mouse acceleration involved.

To set the options, click on the **Apply** button.

Video



Miscellaneous Video Settings

Noise filter

This option defines how the P16-IP reacts to small changes in the video input signal. A large filter setting needs less network traffic and leads to a faster video display, but small changes in some display regions may not be recognized immediately. A small filter displays all changes instantly but may lead to a constant amount of network traffic even if the display content is not

really changing (depending on the quality of the video input signal). All in all the default setting should be suitable for most situations.

Force Composite Sync (Required for Sun Computers)

To support signal transmission from a Sun machine, enable this option. If not enabled the picture of the remote console will not be visible. To set the options, click **Apply**.

4.7.5 Device Settings

Network

The Network Settings panel allows network related parameters to be changed. Each parameter will be explained below. Once applied the new network settings will immediately come into effect.

The screenshot shows a web browser window titled "Home - Microsoft Internet Explorer" with the address bar displaying "http://192.168.2.100/home.asp". The page features the LINDY logo and a navigation menu on the left with options: Home, Console, Remote Control, Virtual Media, User Management, KVM Settings, Device Settings, Network (selected), Dynamic DNS, Security, Certificate, Serial Port, IPMI, Date/Time, Event Log, and Maintenance. The main content area displays the "Network Basic Settings" panel, which includes fields for IP auto configuration (DHCP), IP address (192.168.2.100), Subnet mask (255.255.255.0), Gateway IP address (192.168.2.1), Primary DNS server IP address (192.168.2.1), and Secondary DNS server IP address. Below this is the "Network Miscellaneous Settings" panel, which includes fields for Remote Console & HTTPS port (443), HTTP port (80), TELNET port (23), and Bandwidth Limit (kbit/s). It also has checkboxes for "Enable TELNET access" (checked) and "Disable Setup Protocol". The "LAN Interface Settings" panel shows "Current LAN interface parameters: autonegotiation on, 100 Mbps, full duplex, link ok" and fields for LAN interface speed (Autodetect) and LAN interface duplex mode (Autodetect). An "Apply" button is located at the bottom of the settings panels. The status bar at the bottom of the browser window shows "Applet de.mud.jta.Applet started" and "Internet".

Note: The initial IP configuration is usually done directly at the host system using the special procedure described on **Page 20**.

Changing the network settings of the P16-IP might result in losing connection to it. In case you change the settings remotely make sure that all the values are correct and you still have an option to access the P16-IP.

IP auto configuration

With this option you can control if the P16-IP should obtain its network settings from a DHCP or BOOTP server. For DHCP, select **dhcp**, and for BOOTP select **bootp**. If you choose **none** then IP auto configuration is disabled.

IP address

IP address in the usual dot notation.

Subnet Mask

The net mask of the local network.

Gateway IP address

In case the P16-IP is accessible from networks other than the local one, this IP address must be set to the local network router's IP address.

Primary DNS Server IP Address

IP address of the primary Domain Name Server in dot notation. This option may be left empty; however, the P16-IP will not be able to perform name resolution.

Secondary DNS Server IP Address

IP address of the secondary Domain Name Server in dot notation. It will be used in case the Primary DNS Server cannot be contacted.

Remote Console and HTTPS port

Port number at which the P16-IP's Remote Console server and HTTPS server are listening. If left empty the default value will be used.

HTTP port

Port number at which the P16-IP's HTTP server is listening. If left empty the default value will be used.

Telnet port

Port number at which the P16-IP's Telnet server is listening. If left empty the default value will be used.

Bandwidth limitation

The maximum network traffic generated through the P16-IP's Ethernet device. Value in Kbit/s.

Enable Telnet access

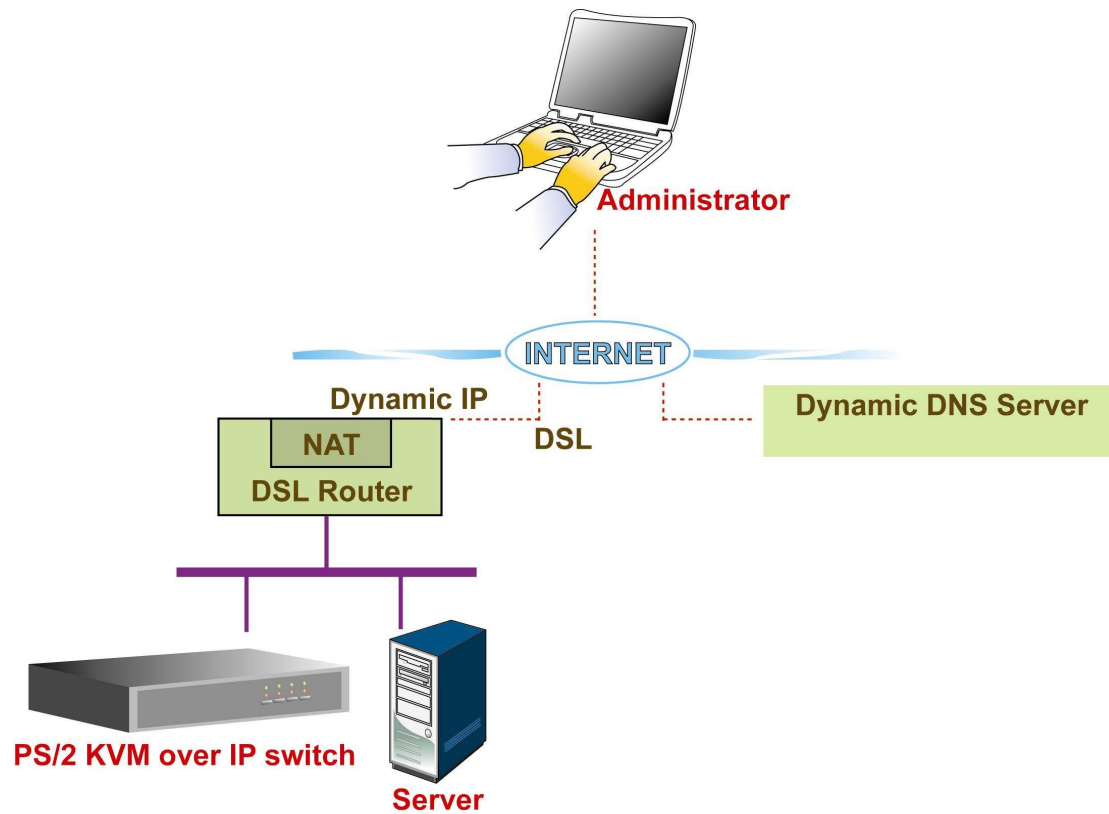
Set this option to allow access to ARA express using the Telnet Gateway (**see the Section called Telnet Console on page 36.**)

Disable Setup Protocol

Enable this option to exclude the P16-IP from the setup protocol.

Dynamic DNS

A freely available Dynamic DNS service (dyndns.org) can be used in the following scenario (see illustration below)

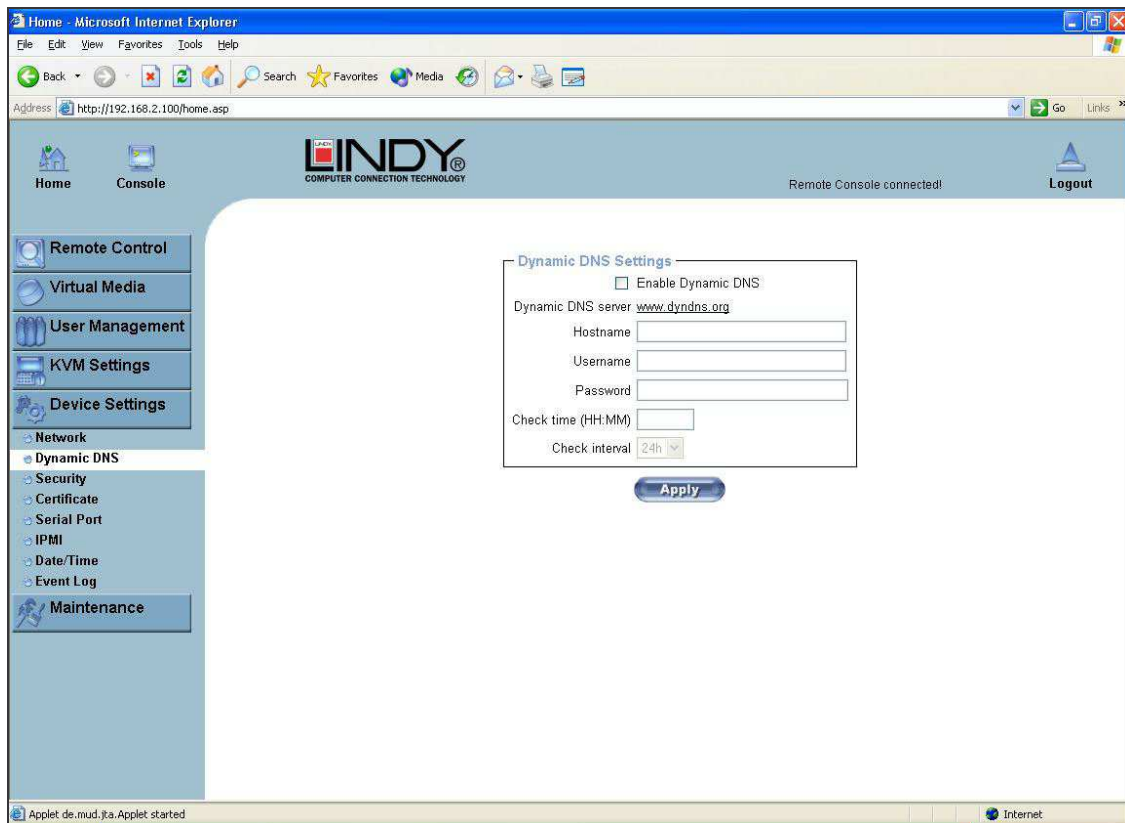


The P16-IP is reachable via the IP address of the DSL router, which is dynamically assigned by the provider. Since the administrator does not know the IP address assigned by the provider, the P16-IP connects to a special dynamic DNS server in regular intervals and registers its IP address there. The administrator may contact this server as well and pick up the same IP address belonging to his device.

The administrator has to register a P16-IP that is supposed to take part in the service with the Dynamic DNS Server and assign a certain hostname to it. He will get a nickname and a password in return. This account information, together with the hostname, is needed in order to determine the IP address of the registered P16-IP.

You have to perform the following steps in order to enable Dynamic DNS:

- Make sure that the LAN interface of the P16-IP is properly configured.
- Open the Dynamic DNS Settings configuration dialog
- Enable Dynamic DNS and change the settings according to your needs (see the next page).



Enable Dynamic DNS

Enables the Dynamic DNS service. This requires a configured DNS server IP address.

Dynamic DNS server

This is the server name where the P16-IP registers itself in regular intervals. At the time of writing, this is a fixed setting since only dyndns.org is currently supported.

Hostname

This is the hostname of the P16-IP that is provided by the Dynamic DNS Server. (Use the whole name including the domain, **e.g. testserver.dyndns.org** not just the actual hostname).

Username

You have registered this username during your manual registration with the Dynamic DNS Server. Spaces are not allowed in the nickname.

Password

The password used during manual registration with the Dynamic DNS Server.

Check time

The P16-IP registers itself in the Dynamic DNS server at this time.

Check interval

This is the interval for reporting again to the Dynamic DNS server by the P16-IP.

Note: The P16-IP has its own independent real time clock. Make sure the time setting of the P16-IP switch is correct. (See the Section called Date and Time on page 63)

Security



Force HTTPS

If this option is enabled, access to the web front-end is only possible using an HTTPS connection. The P16-IP will not listen on the HTTP port for incoming connections.

If you want to create your own SSL certificate that is used to identify the P16-IP **please refer to the section called Certificate on page 58.**

KVM encryption

This option controls the encryption of the RFB protocol. RFB is used by the Remote Console to transmit both the screen data to the administrator's machine and the keyboard and mouse data back to the host. If set to **Off** no encryption will be used. If set to **Try**, the applet tries to make an encrypted connection. If connection establishment fails for any reason an unencrypted connection will be used. If set to **Force** the applet tries to make an encrypted connection. An error will be reported if connection establishment fails.

Certificate

The screenshot shows a Microsoft Internet Explorer browser window displaying the LINDY Remote Console web interface. The address bar shows the URL `http://192.168.2.100/home.asp`. The interface has a blue header with the LINDY logo and navigation links for Home, Console, and Logout. A sidebar on the left contains a menu with options: Remote Control, Virtual Media, User Management, KVM Settings, Device Settings, Network, Dynamic DNS, Security, Certificate (selected), Serial Port, IPMI, Date/Time, Event Log, and Maintenance. The main content area displays the 'Certificate Signing Request (CSR)' form. The form includes input fields for Common name, Organizational unit, Organization, Locality/City, State/Province, Country (ISO code), Email, Challenge password, and Confirm Challenge password. A dropdown menu for 'Key length (bits)' is set to 1024. A 'Create' button is at the bottom of the form. The status bar at the bottom indicates 'Applet de.mud.js:Applet started' and 'Internet'.

The P16-IP uses the Secure Socket Layer (SSL) protocol for any encrypted network traffic between itself and a connected client. During the connection establishment the P16-IP has to expose its identity to a client using a cryptographic certificate.

This certificate and the underlying secret key is the same for all P16-IP units and certainly will not match the network configuration that will be applied to the P16-IP by its user. The certificate's underlying secret key is also used for securing the SSL handshake. Hence, this is a security risk (but far better than no encryption at all).

However, it is possible to generate and install a new certificate that is unique for a particular P16-IP. In order to do this, the P16-IP is able to generate a new cryptographic key and the associated Certificate Signing Request (CSR) that needs to be certified by a certification authority (CA). A certification authority verifies that you are the person you claim you are, and signs and issues a SSL certificate to you.

The following steps are necessary to create and install an SSL certificate for the P16-IP:

1. Create an SSL Certificate Signing Request using the panel shown in the screen shot above. You need to fill out a number of fields that are explained on the next page. Once this is done, click on the **Create** button to initiate the Certificate Signing Request generation. The CSR can be downloaded to your administration machine with the **Download CSR** button (see the illustration on the next page).
2. Send the saved CSR to a CA for certification. You will get the new certificate from the CA after a more or less complicated traditional authentication process (depending on the CA).
3. Upload the certificate to the P16-IP switch using the **Upload** button.

The screenshot shows two web forms. The top form, titled 'Certificate Signing Request (CSR)', displays a list of fields and their values: countryName = TW, stateOrProvinceName = taipei, localityName = taipei, organizationName = test org, organizationalUnitName = test, commonName = test, and emailAddress = test@test.com. Below this list are two buttons: 'Download' and 'Delete'. The bottom form, titled 'Certificate Upload', has a text input field for 'SSL Certificate File' with a 'Browse...' button next to it, and an 'Upload' button below the input field.

After completing these three steps, the P16-IP has its own certificate that is used to identify it to its clients.

Note: If you destroy the CSR on the P16-IP there is no way to get it back! In case you deleted it by mistake, you have to repeat the three steps as described previously.

Common name

This is the network name of the P16-IP once it is installed in the user's network. It is identical to the name that is used to access the P16-IP with a web browser (without the "http://" prefix). In case the name given here and the actual network name differ, the browser will pop up a security warning when the P16-IP is accessed using HTTPS.

Organizational unit

This field is used for specifying to which department within an organization the P16-IP belongs.

Organization

The name of the organization to which the P16-IP belongs.

Locality/City

The city where the organization is located.

State/Province

The state or province where the organization is located.

Country (ISO code)

The country where the organization is located. This is the two-letter ISO code, e.g. DE for Germany, or US for the USA.

Challenge Password

Some certification authorities require a challenge password to authorize later changes on the certificate (e.g. revocation of the certificate). The minimal length of this password is 4 characters.

Confirm Challenge Password

Confirmation of the Challenge Password

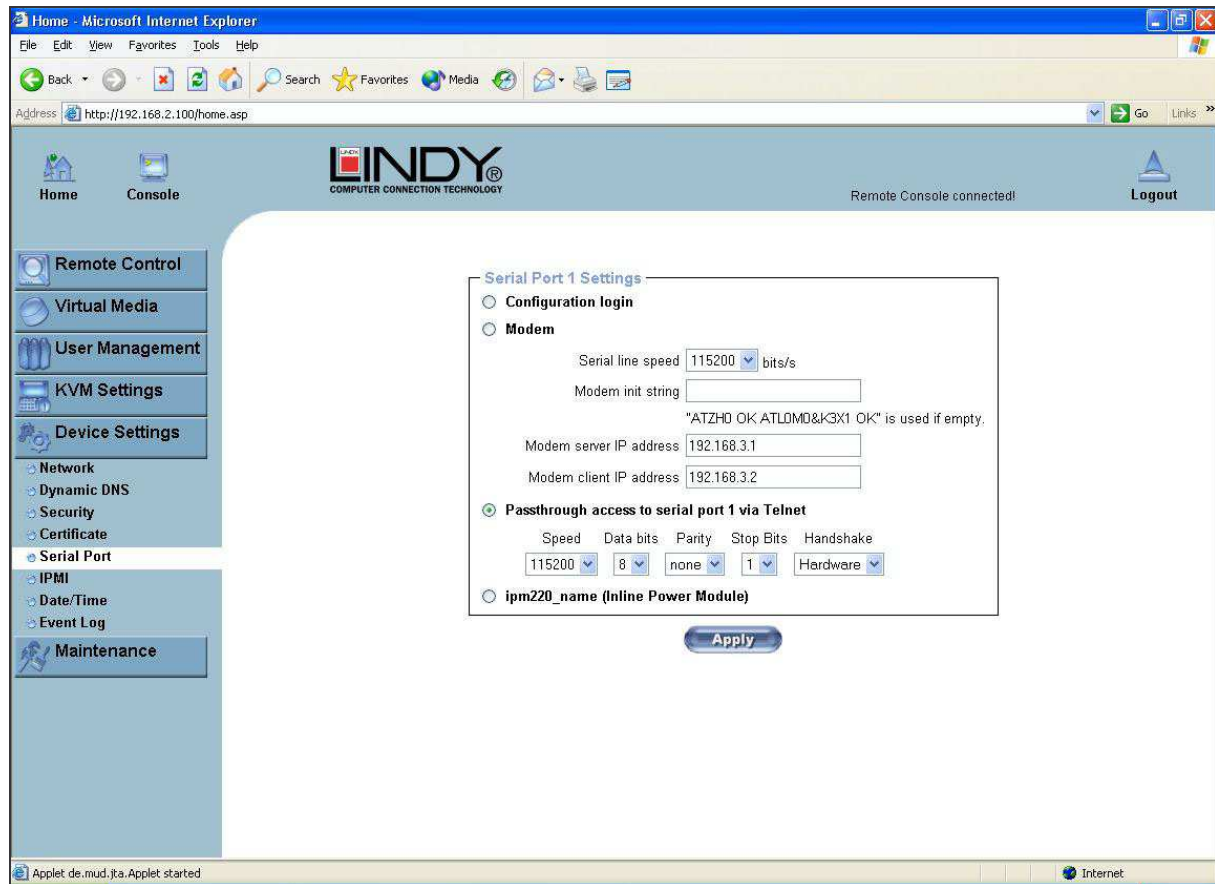
Email

The email address of a contact person that is responsible for the P16-IP and its security.

Key length

This is the length of the generated key in bits. 1024 bits are sufficient for most cases. Longer keys may result in slower response time by the P16-IP during connection establishment.

Serial Port



The P16-IP Serial Settings allow you to specify what device is connected to the serial port and how to use it.

Configuration or console login

Do not use the serial port for any special function; use it only for the initial configuration

Modem

The P16-IP offers remote access using a telephone line in addition to the standard access over the built-in Ethernet adapter. The modem needs to be connected to the serial interface of the P16-IP.

Connecting to the P16-IP using a telephone line allows you to set up a dedicated point-to-point connection from your console computer to the P16-IP. In other words, the P16-IP acts as an Internet Service Provider (ISP) to which you can dial in. The connection is established using the Point-to-Point Protocol (PPP). Before you connect to the P16-IP, make sure you configure your console computer accordingly. For instance, on Windows based operating systems you can configure a dial-up network connection, which defaults to the right settings like PPP.

The Modem Settings panel allows you to configure remote access to the P16-IP using a modem. The meaning of each parameter will be described below. The modem settings are part of the serial settings panel.

- **Serial line speed**

The speed the P16-IP is communicating with the modem. Most modems available today will support the default value of 115200 bps. In case you are using an old modem and discovering problems try to lower this speed.

- **Modem Init String**

The initialization string used by the P16-IP to initialize the modem. The default value will work with all modern standard modems directly connected to a telephone line. In case you have a special modem or the modem is connected to a local telephone switch that requires a special dial sequence in order to establish a connection to the public telephone network, you can change this setting by entering a new string. Refer to your modem's manual about the AT command syntax.

- **Modem server IP address**

This IP address will be assigned to the P16-IP during the PPP handshake. Since it is a point-to-point IP connection virtually every IP address is possible but you must make sure, it is not interfering with the IP settings of the P16-IP and your console computer. The default value will work in most cases.

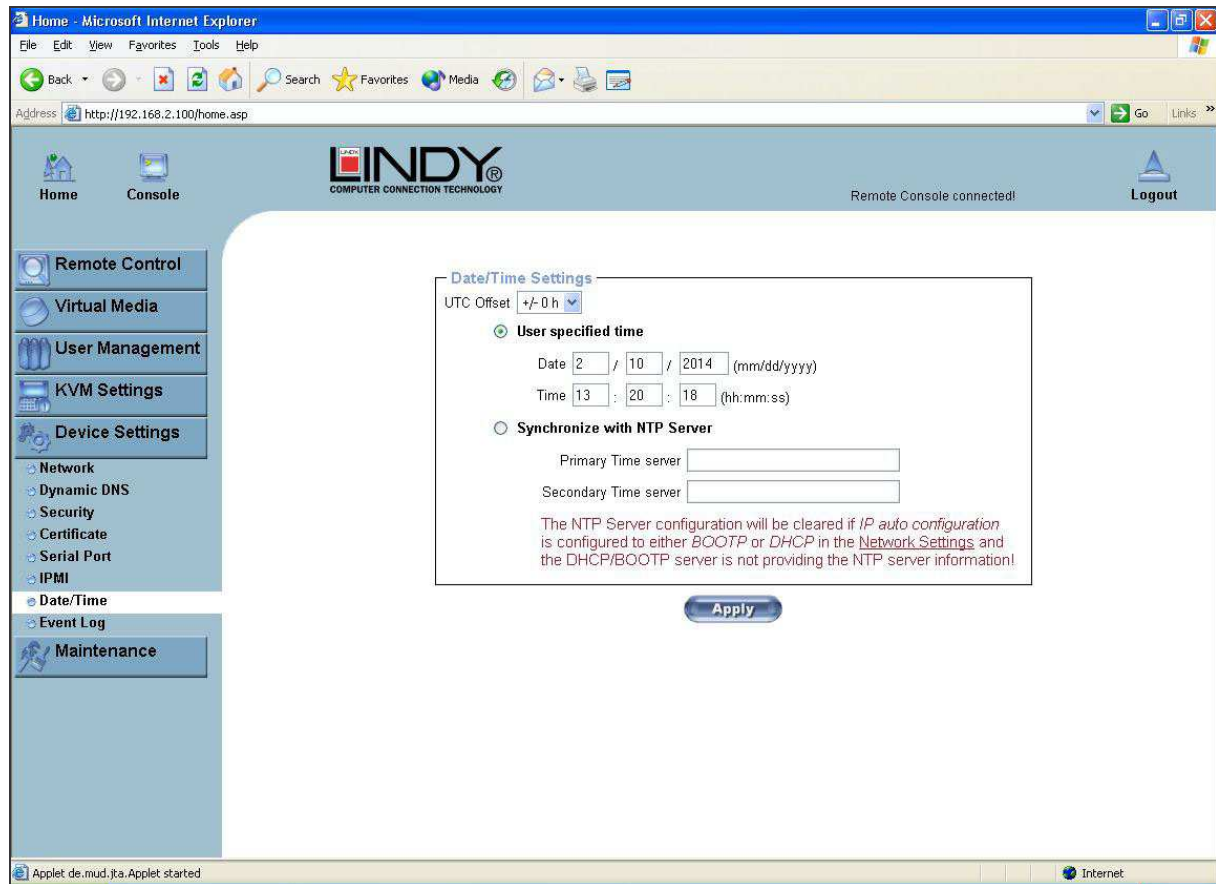
- **Modem client IP address**

This IP address will be assigned to your console computer during the PPP handshake. Since it is a point-to-point IP connection virtually every IP address is possible but you must make sure, it is not interfering with the IP settings of the P16-IP switch and your console computer. The default value will work in most cases.

Passthrough access to serial port via Telnet

Using this option, it is possible to connect an arbitrary device to the serial port and access it (assuming it provides terminal support) via Telnet. Select the appropriate options for the serial port and use the Telnet Console, or a standard Telnet client to connect to the P16-IP.

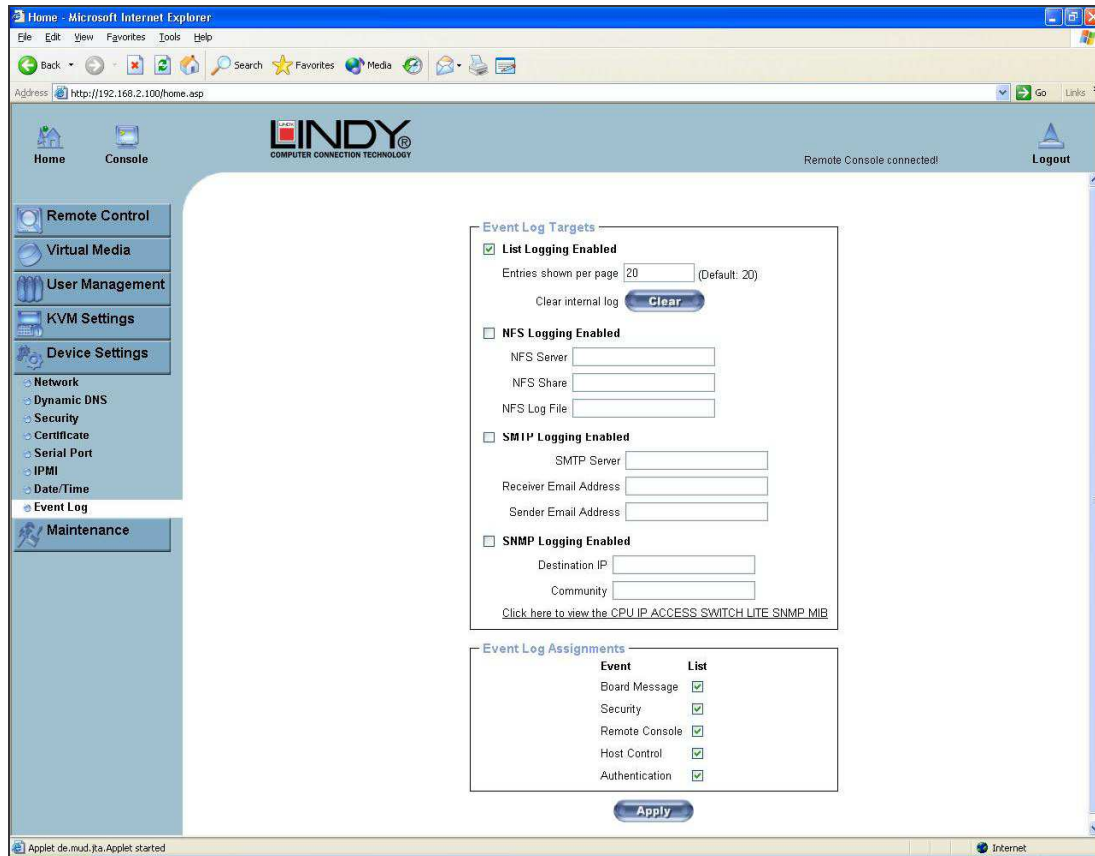
Date And Time



Here you can set the internal real-time clock of the P16-IP. You can adjust the clock manually or use an NTP timeserver. Without a timeserver your time setting will be lost if the P16-IP is powered down for more than a few minutes. To avoid this, you can use an NTP timeserver which sets up the internal clock automatically to the current UTC time. Because the NTP server time is always UTC, there is a setting that allows you to set up a static offset to get your local time.

Note: The P16-IP does not adjust to daylight saving time automatically. So you have to set up the UTC offset according to the local conventions of your country.

Event Log



Important events like a login failure or a firmware update are logged to a selection of logging destinations. Each of those events belongs to an event group, which can be activated separately.

In the Event Log Settings you can choose how many log entries are shown on each page. Furthermore, you can clear the log file here.

List logging enabled

The common way to log events is to use the internal log list of the P16-IP. To show the log list, click on **Event Log** on the **Maintenance** page.

Since the P16-IP's system memory is used to save all the information, the maximum number of possible log list entries is restricted to 1000 events. Every entry that exceeds this limit overrides the oldest one.

Note: If the reset button on the HTML front end is used to restart the P16-IP all logging information is saved permanently and is available after the P16-IP has been started. If the P16-IP loses power or a hard reset is performed, all logging data will be lost. To avoid this, use one of the log methods described below.

NFS Logging enabled

Defines an NFS server to write all logging data to a file that is located there. To write logging data from multiple P16-IP units to only one NFS share, you have to define a file name that is unique for each device. When you change the NFS settings and press **Apply**, the NFS share will be mounted immediately. That means, the NFS share and the NFS server must be filled with valid sources or you will get an error.

SMTP Logging enabled

With this option, the P16-IP is able to send Emails to an address given by the Email address text field in the Event Log Settings. These mails contain the same description strings as the internal log file and the mail subject is filled with the event group of the occurred log event. In order to use this log destination you have to specify an SMTP server that has to be reachable from the P16-IP and that needs no authentication at all (<serverip>:<port>).

SNMP Logging enabled

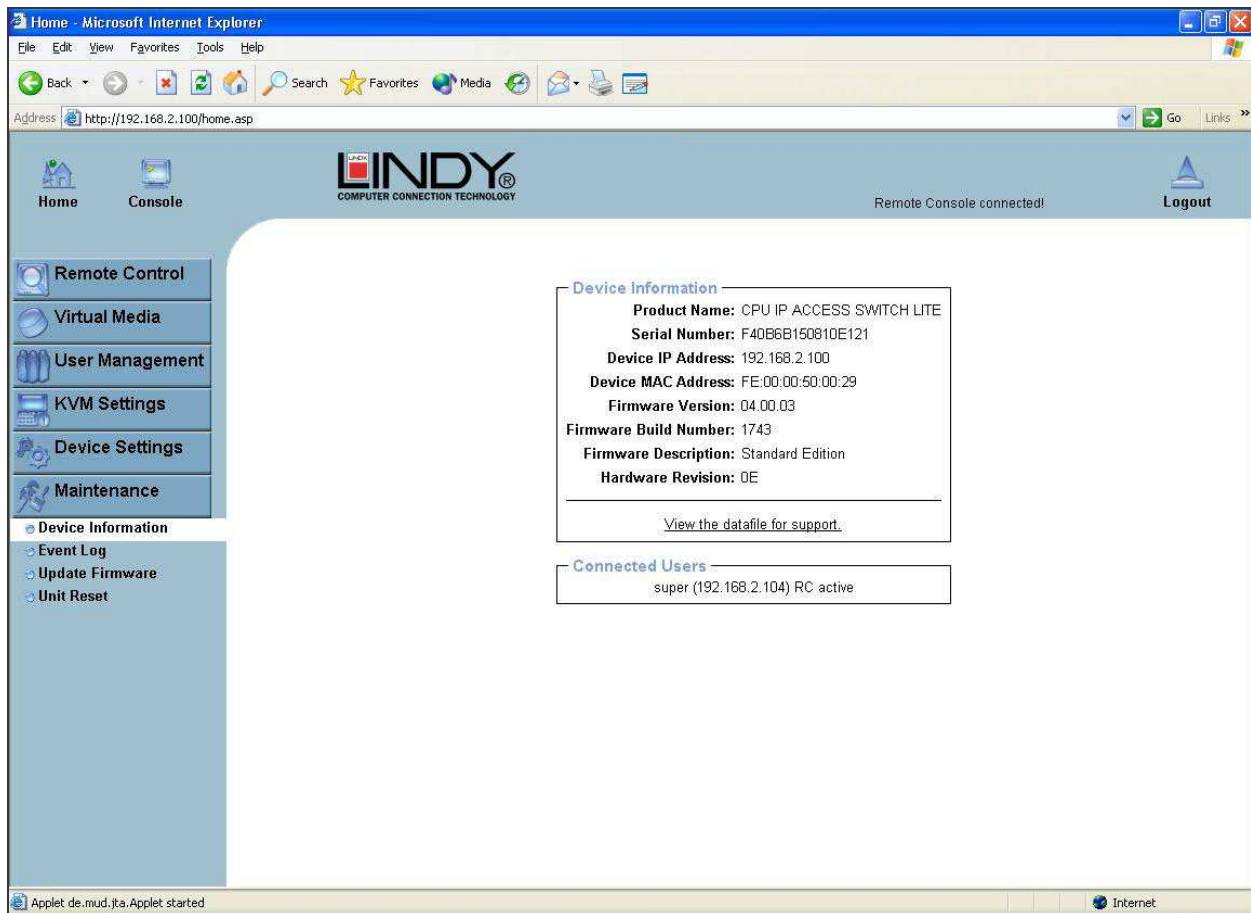
If this is activated, the P16-IP sends an SNMP trap to a specified destination IP address every time a log event occurs. If the receiver requires a community string, you can set it in the appropriate text field. Most of the event traps only contain one descriptive string with all information about the log event. Only authentication and host power events have a trap class that consists of several fields with detailed information about the occurred event. To receive these SNMP traps, any SNMP trap listener may be used.

Warning In contrast to the internal log file on the P16-IP, the size of the NFS log file is not limited. Every log event will be appended to the end of the file so it grows continuously, so you may have to delete it or move it from time to time.

4.7.6 Maintenance

Device Information

This section contains a summary showing various information about the P16-IP and its current firmware. It also allows you to reset the unit.



View the data file for support

Allows you to download the P16-IP data file with specific support information. This is an XML file with certain customized support information like the serial number etc. You can send this information if you contact LINDY technical support. It may help us solve any problems.

Connected Users

The example below displays the P16-IP activity. From left to right the connected user(s), its IP address (from which host the user comes from) and its activity status is displayed. **RC** means that the Remote Console is open. If the Remote Console is opened in exclusive mode the term (exclusive) is added. For more information about this option see the section called **Remote Console Control Bar** on page 30.

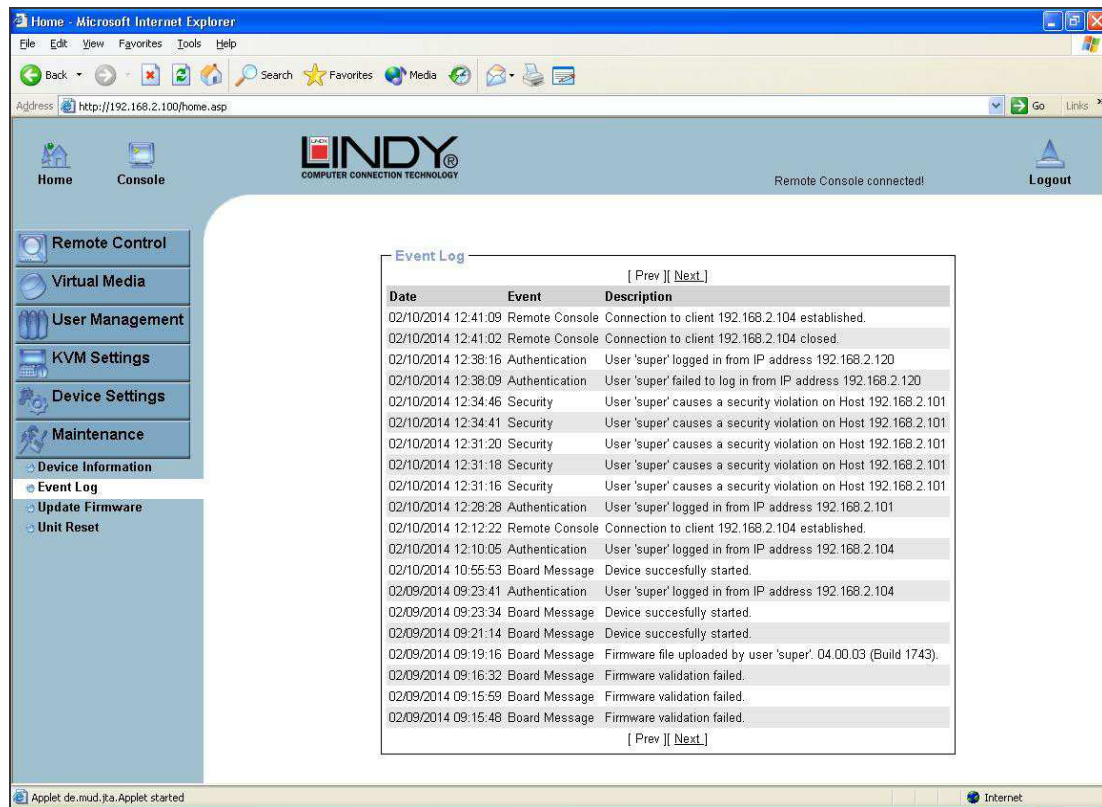
To display the user activity, the last column contains either the term **active** for an active user or **20 min idle** for a user who is inactive for a certain amount of time.

Connected Users

test (62.238.0.39)	active
test (80.145.25.183)	26 min idle
test (212.183.10.29)	20 min idle
test (62.153.241.228) RC (exclusive)	active

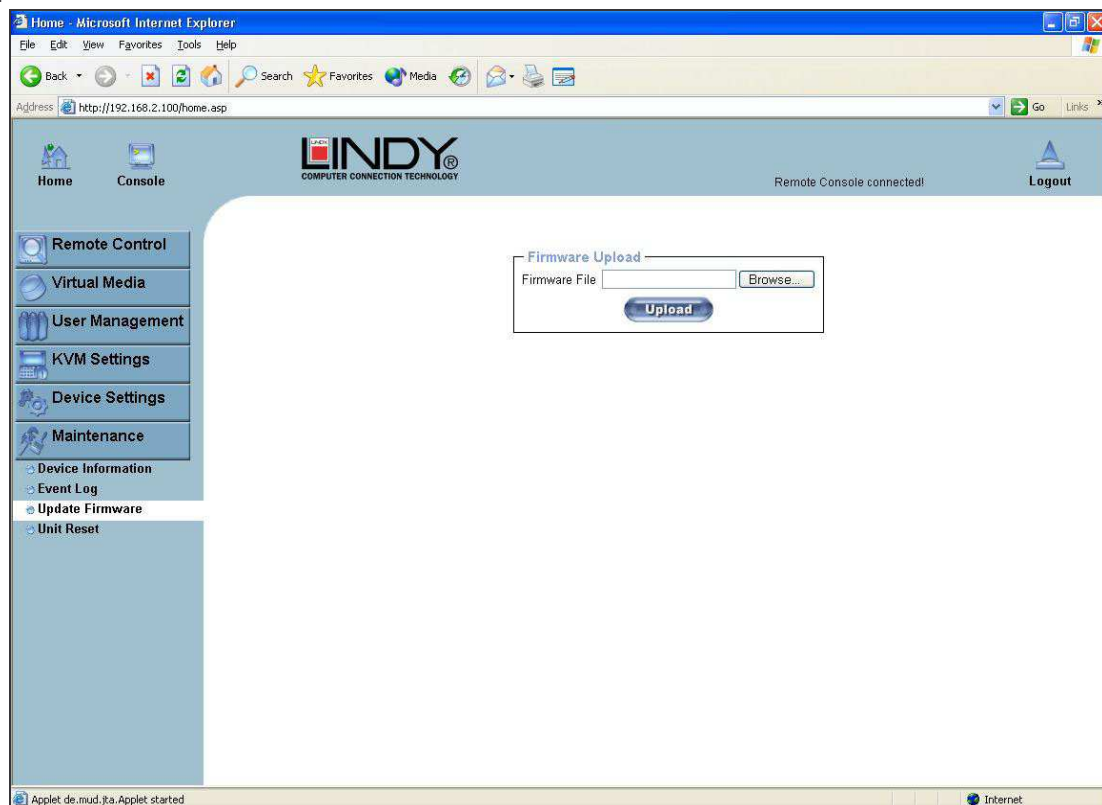
Event Log

Displays the log list including the events that are logged by the P16-IP.



Update Firmware

The P16-IP is a complete standalone computer. The software it runs is called the firmware. The firmware of the P16-IP can be updated remotely in order to install new functionality or special features.



A new firmware update is a binary file which can be sent to you by email or which you can download from our website **www.lindy.com**.

Updating the firmware is a four stage process:

1. The new firmware file is uploaded to the P16-IP. In order to do this you need to select the file on your local system using the **Browse** button on the Upload Firmware panel. Once the firmware file has been uploaded it is checked whether it is a valid firmware file and whether there were any transmission errors. In case of any error the Upload Firmware function will be aborted.
2. If everything went well you will see the Update Firmware panel. The panel shows you the version number of the currently running firmware and the version number of the uploaded firmware. Pressing the **Update** button will replace the old version with the new one.
3. After the firmware has been stored, the P16-IP will automatically reset itself. Half a minute after the reset the P16-IP will run with the new firmware version and should be accessible. However, you will be required to login once again.
4. Once you have logged in we recommend you delete the **Temporary Internet Files** from your browser to ensure that the appearance of the web interface is correct. To do this in Internet Explorer, select:

Tools > Internet Options > General > Delete Files

Tick the check box: **Delete all offline content**, and click **OK**

Note: The firmware update process and consistency check means that making a mistake when updating the firmware is very unlikely. However, we recommend only experienced users or administrators should perform the firmware update. This process is not reversible and may take some minutes. Make sure the P16-IP's power supply will not be interrupted during the update process!

Tip: Should your keyboard fail to operate correctly, in the remote console, after a firmware update please use the **Reset Keyboard/Mouse** option in the **Maintenance** section as described on **page 69**.

Unit Reset

This section allows you to reset specific parts of the device. This involves the keyboard and mouse, the video engine and the P16-IP itself.



Resetting the unit itself is mainly needed to activate a newly updated firmware. It will close all current connections to the administration console and to the Remote Console.

The whole process will take about half a minute. Resetting sub devices (e.g. the video engine) will take a few seconds only and does not result in connections closing. To reset individual P16-IP functionality, click on the Reset button.

Note: Only the super user is allowed to reset the P16-IP.

Troubleshooting

If none of the LED displays on the KVM Switch are illuminated, please check that the power adapter is connected and switched on at the mains.

Before you check any further please make sure that all cables are well connected!

KVM Switch Troubleshooting

If the KVM Switch reacts to keyboard input from the SCROLL LOCK key with a beep signal but you get no monitor picture displayed please check if the currently selected computer is in sleep mode or powered down. You can try to wake up this computer by pressing the ESCAPE key several times until the CPU Switch no longer beeps, and then pressing spacebar or RETURN key to wake up the computer. The P16-IP supports VGA power save modes and suspends the monitor signal if the currently selected computer has switched off the VGA signal.

Please check if your problems can be solved by resetting the CPU switch, via the push buttons on the front panel. For cascaded systems please follow the procedures mentioned in the CASCADING section.

1. **The Monitor picture is not sharp or shows shadows**
 - The maximum recommended VGA cable distance is 5 metres without ghosting and degradation.
 - Make sure you have used high quality video cables with coaxial cores. If the diameter of the cable is less than 6mm then the cable may not be high enough quality.
2. The maximum recommended PS/2 cable distance is 5 metres. Normally, the cable length is based on the electronic driver capacity of your motherboards PS/2 ports. If you need longer PS/2 distances it may be necessary to use a PS/2 extender.
3. Don't press any keys on the keyboard while the selected computer is booting up. Otherwise it may cause a keyboard error, or the keyboard may not be detected at the PC side.
4. **The computer boots up fine, but the keyboard doesn't work**

Make sure the keyboard works when directly plugged into the computer. Try a different keyboard, but use standard PS/2 keyboards (some keyboards with extra multimedia keys may not be supported).
5. **The Mouse is not detected during PC boot up**
 - Make sure the mouse works when directly plugged into the computer. You have to install the appropriate mouse driver on all connected computers!
 - Make sure the mouse is a true PS/2 mouse. A combo mouse will work just as long as it is set for PS/2 mode with the correct adapter. Try a different mouse.
 - Some advanced mice like radio frequency mice, 5 button mice and scroll wheel mice use very uncommon proprietary signals. Although LINDY has carefully checked for the highest compatibility, we cannot guarantee that the P16-IP will work with all known mice, especially those developed and produced after the P16-IP's introduction.
 - Avoid moving the mouse or pressing the mouse buttons when switching ports.
 - Avoid switching ports during the PC shut down process.
6. If you have forgotten the OSD "**password**" please contact LINDY.

IP Access Troubleshooting

1. **The remote mouse doesn't work or is not synchronized**
Make sure the mouse settings in P16-IP match the mouse model. Use the **Intelligent Sync** option from the **Mouse Handling** sub menu of the Remote Console **Options** menu.
2. **The remote mouse does not work correctly**
Try using the **Reset Keyboard/Mouse** option in the **Maintenance** section as described on **page 69**.
3. **The video quality is bad or the picture is grainy**
Try to correct the brightness and contrast settings (**see Page 33**) until they are out of a range where the picture looks grainy. Use the auto adjustment feature to correct a flickering video.
4. **Login on P16-IP switch fails.**
Was the correct combination of user and password given? The default user name is **super** and the password is **pass**. Furthermore, your browser must be configured to accept cookies.
5. **The Remote Console window can't connect to the P16-IP.**
Possibly a firewall prevents access to the Remote Console. Make sure the TCP port numbers 443 or 80 are open for incoming TCP connections. Install the latest version of Java Virtual Machine,
6. **No connection can be established to the P16-IP.**
Check whether the network connection is working in general (ping the IP address of P16-IP). If not, check the network hardware. Is the P16-IP powered on? Check whether the IP address of P16-IP switch and all other IP related settings are correct! Also verify that all the IP infrastructure of your LAN, including routers etc., is correctly configured.
7. **Special key combinations, e.g. ALT+F2, ALT+F3 are intercepted by the console system and not transmitted to the host.**
You have to define a so-called **Button Key**. This can be done in the Remote Console settings.
8. **In the browser the P16-IP switch pages are inconsistent.**
Clear **Temporary Internet Files** from your browser. To do this in Internet Explorer, select:

Tools > Internet Options > General > Delete Files

Tick the check box: **Delete all offline content**, and click **OK**
9. **Windows XP doesn't awake from standby mode**
This could be a Windows XP problem. Try not to move the mouse while XP goes into standby mode.
10. **Every time I open a dialog box with some buttons, the mouse pointers are not synchronous anymore**
Please check if you have an option like '**Automatically move mouse pointer to the default button of dialog boxes**' enabled in the mouse settings of the operating system. This option needs to be disabled.

Key Codes

This table shows the key codes used to define keystrokes or hotkeys for several functions. Please note that these key codes do not necessarily represent key characters that are used on international keyboards. They name a key on a standard 104 key PC keyboard with US English language mapping.

0 - 9
A - Z
, TILDE
; MINUS
=, EQUALS
'
<, LESS
.
/, SLASH
BACK SPACE
TAB
[
]
ENTER
CAPS LOCK
\, BACK SLASH
LSHIFT, SHIFT
RCTRL
RSHIFT
LCTRL, CTRL
LALT, ALT
SPACE
ALTGR
ESCAPE, ESC
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
PRINTSCREEN
SCROLL LOCK
BREAK
INSERT
HOME
PAGE UP
DELETE
END
PAGE DOWN
UP
LEFT
DOWN
RIGHT
NUM LOCK
NUMPAD0
NUMPAD1
NUMPAD2
NUMPAD3
NUMPAD4
NUMPAD5
NUMPAD6
NUMPAD7
NUMPAD8
NUMPAD9
NUMPADPLUS,NUMPAD PLUS
NUMPAD/
NUMPADMINUS,NUMPAD MINUS
NUMPADENTER
WINDOWS
MENU

The layout for this keyboard is also shown. However, most modifier keys and other alphanumeric keys used for hotkey purposes in application programs are in an identical position, no matter what language mapping you are using. Some of the keys have aliases also; they can be named by 2 key codes (separated by a comma in the previous table).

Esc	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	Prnt	ScrL	Brk					
~	1	2	3	4	5	6	7	8	9	0	-	=	Bsp	Ins	Posl	Pgup	Num	/	*	-
tab	q	w	e	r	t	y	u	i	o	p	[]	CR	Del	End	Pgdn	7	8	9	+
Caps	a	s	d	f	g	h	j	k	l	;	'	\		4	5	6				
LShift	z	x	c	v	b	n	m	,	.	?	Rshift			Up	1	2	3	CR		
Lctrl	Win	Alt	Space					AltGR	Menu	RCtrl	Left	Down	Right		0	,				

Video Modes

The table below lists the video modes that the P16-IP remote console supports. Please do not use any other custom video settings; the P16-IP may not be able to detect them.

Resolution (x, y)	Refresh Rates (Hz)
640 x 350	70, 85
640 x 400	56, 70, 85
640 x 480	60, 67, 72, 75, 85, 90, 100, 120
720 x 400	70, 85
800 x 600	56, 60, 70, 72, 75, 85, 90, 100
832 x 624	75
1024 x 768	60, 70, 72, 75, 85, 90, 100
1152 x 864	75
1152 x 870	75
1152 x 900	66
1280 x 960	60
1280 x 1024	60, 75

WEEE (Waste of Electrical and Electronic Equipment), Recycling of Electronic Products



United Kingdom

In 2006 the European Union introduced regulations (WEEE) for the collection and recycling of all waste electrical and electronic equipment. It is no longer allowable to simply throw away electrical and electronic equipment. Instead, these products must enter the recycling process.

Each individual EU member state has implemented the WEEE regulations into national law in slightly different ways. Please follow your national law when you want to dispose of any electrical or electronic products.

More details can be obtained from your national WEEE recycling agency.

Germany / Deutschland

Die Europäische Union hat mit der WEEE Direktive umfassende Regelungen für die Verschrottung und das Recycling von Elektro- und Elektronikprodukten geschaffen. Diese wurden von der Bundesregierung im Elektro- und Elektronikgerätegesetz – ElektroG in deutsches Recht umgesetzt.

Dieses Gesetz verbietet vom 24.März 2006 an das Entsorgen von entsprechenden, auch alten, Elektro- und Elektronikgeräten über die Hausmülltonne! Diese Geräte müssen den lokalen Sammelsystemen bzw. örtlichen Sammelstellen zugeführt werden! Dort werden sie kostenlos entgegen genommen. Die Kosten für den weiteren Recyclingprozess übernimmt die Gesamtheit der Gerätehersteller.

France

En 2006, l'union Européenne a introduit la nouvelle réglementation (WEEE) pour le recyclage de tout équipement électrique et électronique.

Chaque Etat membre de l' Union Européenne a mis en application la nouvelle réglementation WEEE de manières légèrement différentes. Veuillez suivre le décret d'application correspondant à l'élimination des déchets électriques ou électroniques de votre pays.

Italy

Nel 2006 l'unione europea ha introdotto regolamentazioni (WEEE) per la raccolta e il riciclo di apparecchi elettrici ed elettronici. Non è più consentito semplicemente gettare queste apparecchiature, devono essere riciclate.

Ogni stato membro dell' EU ha tramutato le direttive WEEE in leggi statali in varie misure. Fare riferimento alle leggi del proprio Stato quando si dispone di un apparecchio elettrico o elettronico.

Per ulteriori dettagli fare riferimento alla direttiva WEEE sul riciclaggio del proprio Stato.

CE Statement

This device complies with the European Regulations for Electromagnetic Compatibility (EMC) of the European Union and it is equipped with the CE mark. This unit has to be used with high quality shielded connection cables. Only if these high quality shielded cables are used can it be sure that the EMC compatibility is not adversely influenced.

FCC Statement

Shielded cables must be used with this equipment to maintain compliance with radio frequency energy emission regulations and ensure a suitably high level of immunity to electromagnetic disturbances.

FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received; including interference that may cause undesired operation.



For Commercial Use Only
Tested to comply
with FCC Standards

